FOUNDED IN 1856

RAILWAY AGE

JULY 30, 1949

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Baldwin diesel electric switching and transfer locomotives—get the tough jobs

That is because they have repeatedly demonstrated their ability to handle such jobs with the speed, efficiency and dependability that mean better switching and road switching operations.

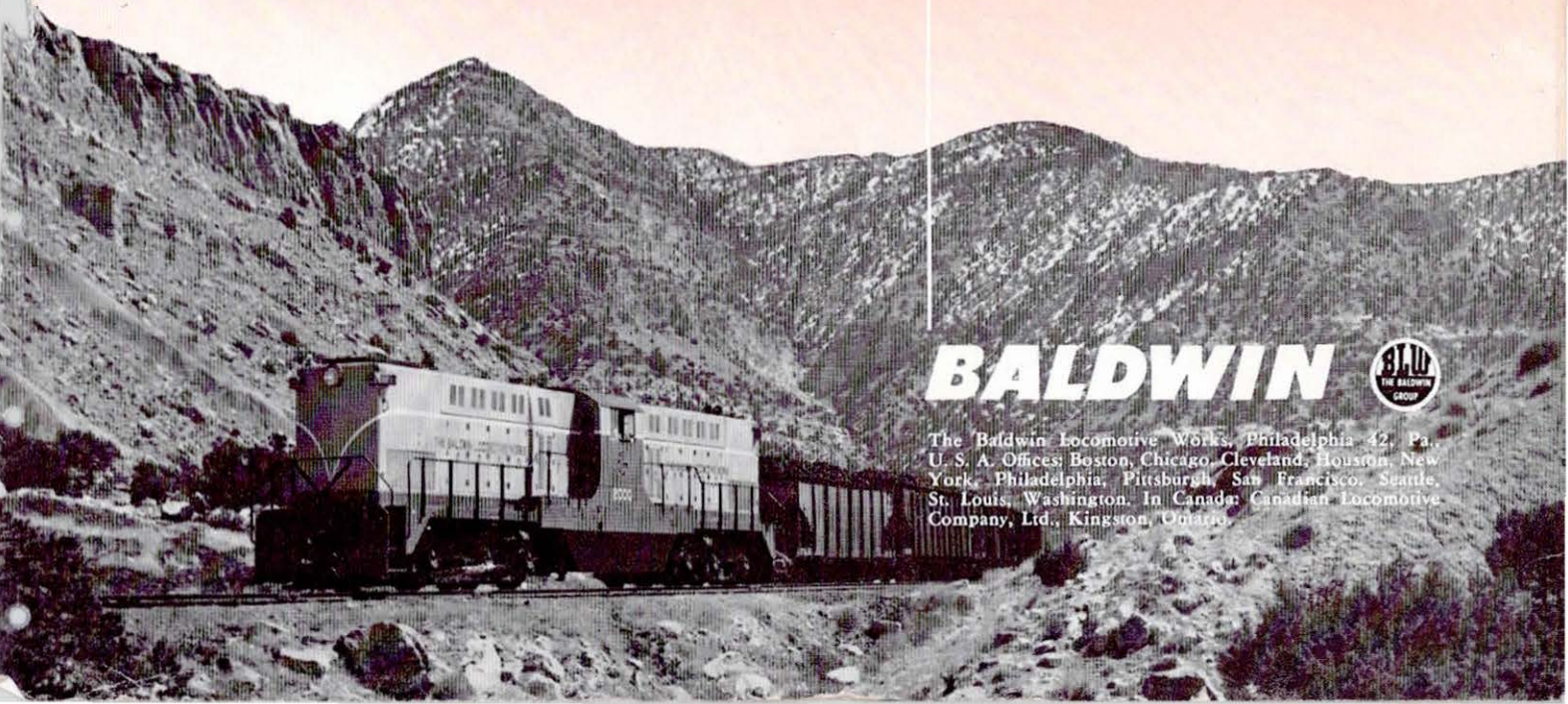
You will find the right locomotive for every switching assignment among the following Baldwin diesel-electrics:

750-hp and 1000-hp Switchers
1000-hp Road Switcher
1500-hp Road Switchers with 4-wheel or 6-wheel trucks
1500-hp Heavy Duty Road Switcher with 6 traction motors
2000-hp Transfer locomotive with 6 traction motors.

If you have an extra tough road switching, transfer or hump yard problem—one requiring exceptionally high tractive effort in a single unit—we would like to tell you more about the Baldwin 6-motor Road Switching and Transfer locomotives. Write for Bulletin 293.

Baldwin Products for the Railroads

Locomotives of all types, locomotive replacement parts such as boilers, fireboxes, rolled steel wheels and tires, axles, connecting rods, motion work, equalizers, springs, steel forgings and castings. For the railroad shop Baldwin offers hydraulic metal forming, wheel and bushing presses; plate planers; bending rolls; equipment for static and dynamic testing.



BALDWIN

The Baldwin Locomotive Works, Philadelphia 42, Pa., U. S. A. Offices: Boston, Chicago, Cleveland, Houston, New York, Philadelphia, Pittsburgh, San Francisco, Seattle, St. Louis, Washington. In Canada: Canadian Locomotive Company, Ltd., Kingston, Ontario.

IMMEDIATE . . .

SAVINGS WITH Chilled Car Wheels

- **Immediate and substantial savings in wheel investment.**
- **Immediate reduction in replacement and wheel shop costs.**
- **Immediate delivery from 26 strategically located member plants—reducing inventory requirements.**
- **Improved design—assuring greater safety, strength and durability.**

★ ★ ★

Details of these economies can be obtained from any member of the Association of Manufacturers of Chilled Car Wheels.

Remember—Over 65% of the nation's railroad freight is carried on Chilled Car Wheels.

ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS

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American Car & Foundry Co. · Canadian Car & Foundry Co. · Griffin Wheel Co.
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Southern Wheel (American Brake Shoe Co.)

Published weekly by Simmons-Boardman Publishing Corporation, Orange, Conn. Executive Offices, 30 Church Street, New York 7, N. Y. Entered as second class matter at Orange, Conn., under the act of March 3, 1879. Subscription price $6.00 for one year. U. S. and Canada. Single copies, 50 cents each. Vol. 127. No 5.

FRISCO

The Frisco's Meteor, fine streamliner with fast overnight service between St. Louis and Oklahoma City.

At Your Service

As an instrument of service, the modern railroad has few peers. When the passenger boards a streamlined sleeper-car train, he is, in effect, boarding a first-class hotel on wheels. He finds waiting for him unusual provisions for his comfort and relaxation. He finds, too, the safest and best equipment that science can develop. . . . The average passenger gives little thought to the wheels, yet they are among the busiest parts of any train. For years Bethlehem has been furnishing wrought-steel wheels to American railroads, wheels that have helped assure safe, relaxing travel for millions of riders. You cannot buy finer wheels anywhere—a fact borne out by the great numbers of Bethlehem wheels in daily use on the nation's crack railway systems.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
On the Pacific Coast Bethlehem products are sold by
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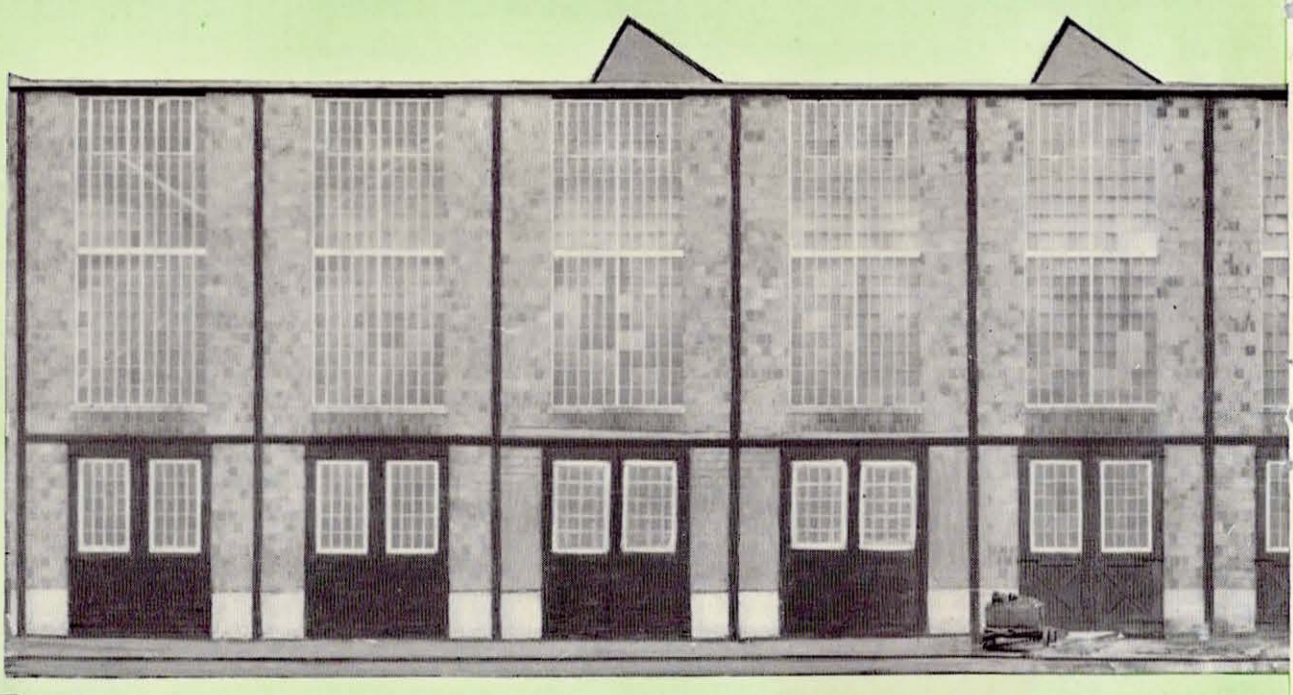
BETHLEHEM STEEL

Bethlehem **WROUGHT-STEEL WHEELS**

Its LOW MAINTENANCE



Alco GE

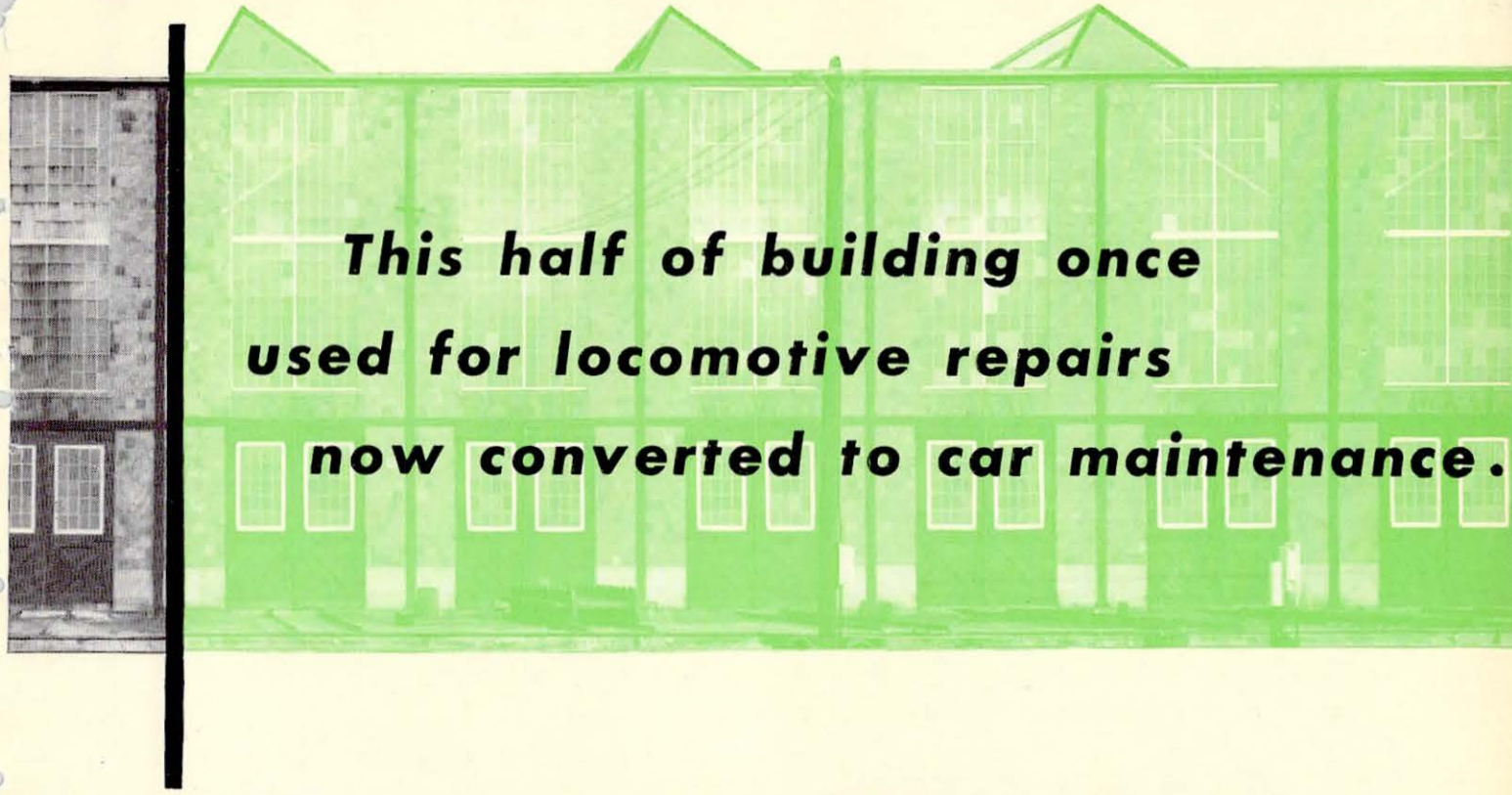
AMERICAN LOCOMOTIVE

Recently, Mr. S. T. W. Green, Vice President and General Manager of the Lehigh and New England Railroad, told us, "We no longer need to build a new car shop because our new Alco-G.E. diesel-electrics have permitted a tremendous reduction in space required for locomotive maintenance and repair. In fact, we dispensed entirely with our need for the engine house and require only one-half our former locomotive back shop. The other half of the back shop is now used exclusively for repairing and rebuilding railroad cars. Thus, in a very real sense, Alco-G.E., through these locomotives, gave us a car shop."

The L. & N. E. placed the order for their Alco-G.E. locomotives as the result of a motive-power study made in 1947. This study was based only on operating and maintenance savings of the Alco-G.E. units. The actual application of Alco-G.E. locomotives provided an unexpected dividend by saving a planned capital expenditure for a new car shop.

Diesel-electric operating and maintenance savings are a known quantity on most railroads today. Extra dividends, such as those realized on the L. & N. E. may be available to your railroad. Your Alco-G.E. representative is prepared to help you find them.

gave us a CAR SHOP



and GENERAL ELECTRIC

IN CANADA Alco GE IS MLW GE

113-228

More and More Steel— Better and Better Cars

NAILABLE STEEL FLOORING

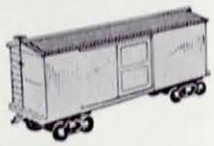
Marks Another Great Advance In Boxcar Development

Step by step, unit by unit, steel won its way in boxcar construction until it had supplanted less durable materials in all main units but one. The floor—because blocked loads must be held by nailing—remained unchanged. . . . Then came NAILABLE STEEL FLOORING—combining superior strength and easy nailability—and now the boxcar, in all parts subjected to stress and hard use, is truly a *steel* car.

Just as each added use of steel—in underframes, ends, body framing, sheathing and roofs—lowered costs of operation and maintenance, so does its newest use in NAILABLE STEEL FLOORING. You can't beat steel for resistance to stress and wear—you can't equal NAILABLE STEEL FLOORING for durability, freedom from breakthroughs, and maximum protection for either blocked or loose freight.

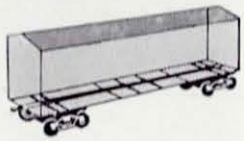
PATENTS PENDING

Evolution of the Boxcar



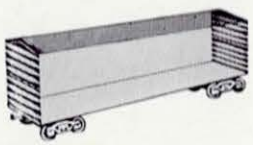
CHIEFLY WOOD

In 1880, steel was used in boxcars only in trucks, truss rods, couplings, fittings and accessories. Cars of those days needed frequent repairs, were short lived.



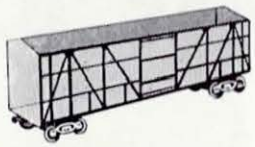
STEEL UNDERFRAMES

Steel became a major factor in boxcar construction when it began to be used in underframes. As a result of its greater strength, downtime for repairs and maintenance costs were substantially reduced.



STEEL ENDS

Breakthroughs caused by the sliding of ladings upon sudden stops were common until steel ends came into use. Again, the greater strength of steel resulted in reduced costs.

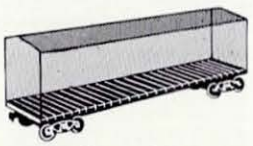


STEEL BODY FRAMING

The more steel, the more strength—and body framing of steel worked a further reduction in maintenance and repair costs.

STEEL ROOFS AND SIDES

With the addition of steel side sheathing and steel roofs, the only non-steel part subject to stress and wear was the floor. Because nailability was essential, it remained unimproved.



NAILABLE STEEL FLOORING

Here is the latest important step in the gradual change to steel construction. NAILABLE STEEL FLOORING, made of corrosion-resisting NAX HIGH-TENSILE steel, has proved its excellence—by providing a superior surface for all types of boxcar freight, and by standing up under heavy freight and modern mechanical handling equipment.

NAILABLE STEEL FLOORING

A GREAT LAKES STEEL PRODUCT

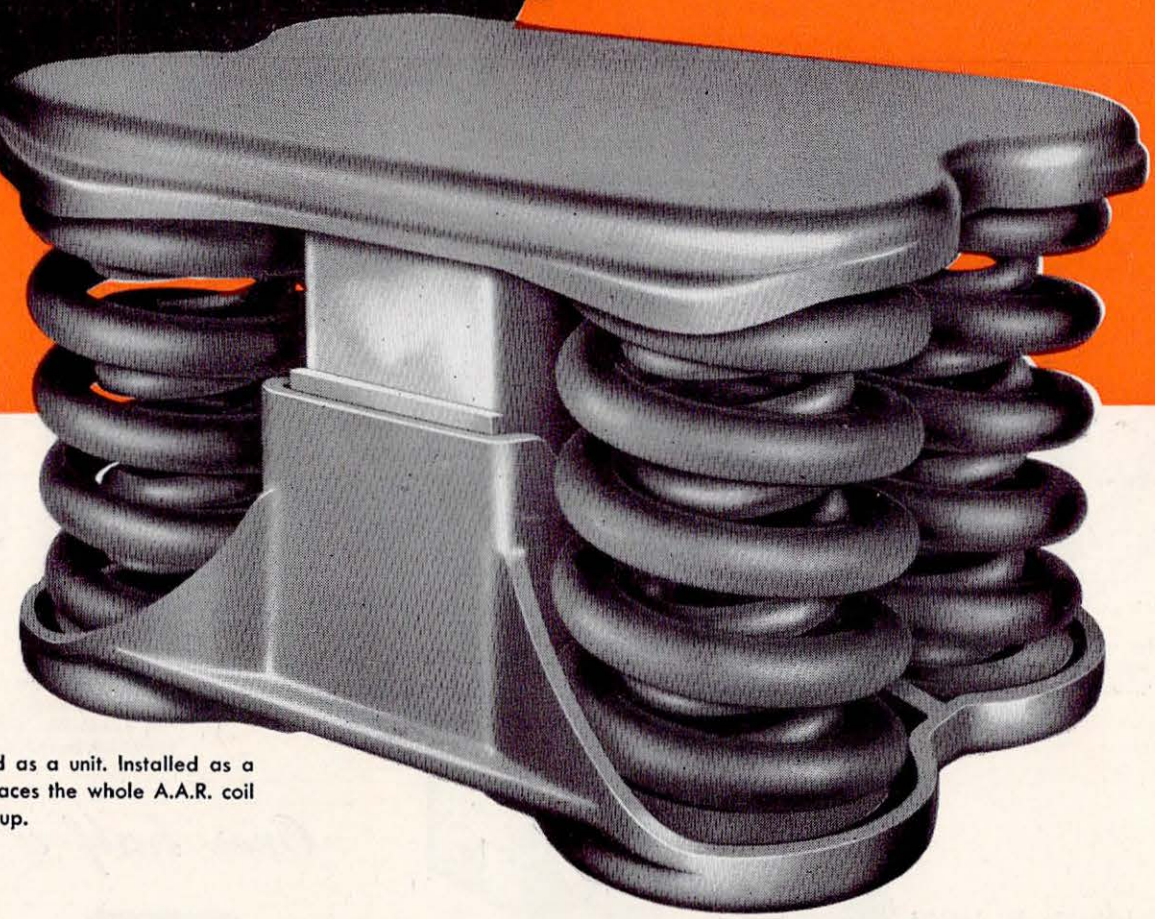
GREAT LAKES STEEL *Corporation*

Steel Floor Division • Penobscot Bldg. • Detroit 26, Mich.
UNIT OF NATIONAL STEEL CORPORATION

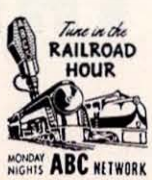
...for a *Soft, Smooth, Easy Ride* with Ordinary Freight Car Trucks!

A·S·F *Ride-Control* PACKAGE

The "Package Way" is the *easy way* to modern lading protection—to economy in maintenance of both rolling stock and roadbed. Soft, long-travel springs cushion the load—absorb dynamic shocks. Constant, *uniform* friction smooths and controls all bolster motion. Convenient to handle. Simple to install. *Remarkably effective.* There couldn't be a better time than *now* to get the facts.



● Shipped as a unit. Installed as a unit. Replaces the whole A.A.R. coil spring group.



Ask Your A. S. F. Representative for "Package" Performance Data

AMERICAN STEEL FOUNDRIES

MINT MARK OF ⬡ FINE CAST STEEL

Specify PYLE-NATIONAL

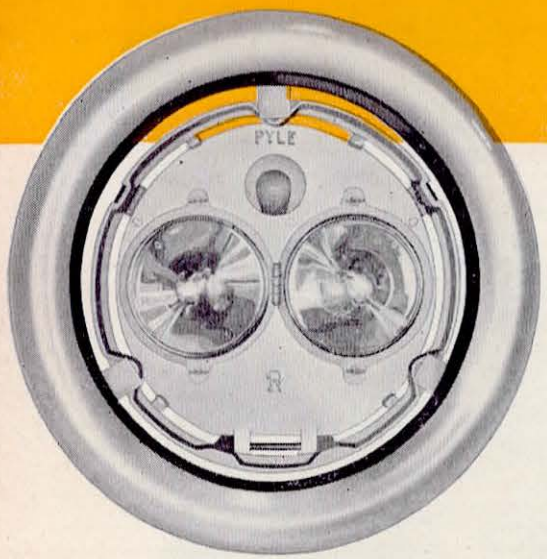
sealed-beam

HEADLIGHTS...ADAPTERS..

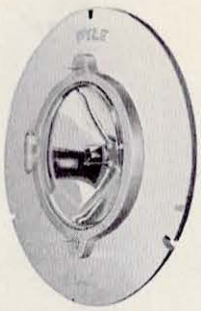
....for Quality....Durability..

Single and Twin Sealed Beam Adapters

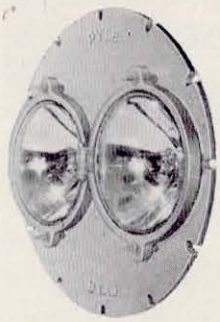
for the Standard 12-inch and 14-inch Pyle Headlights now in service. Mounting plates are designed to use the same mounting holes as the glass or metal reflectors which they replace, providing for simple and economical conversion to Sealed Beam lamps.



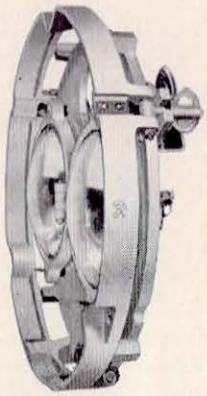
Twin Adapter with 3 point suspension, Cat. No. 14595-DP mounted in a standard 14-inch flush type Pyle headlight for Diesel Locomotives.



Single Sealed Beam Adapter, Cat. No. 12595-S for 12-inch Pyle headlights.



Twin Sealed Beam Adapter, Cat. No. 14595-S for 14-inch Pyle headlights.



Twin Sealed Beam Adapter—3 point suspension—relamping from rear for 14-inch Pyle headlights. With pilot light, Cat. No. 14595-DP. Less pilot light, Cat. No. 14595-D.

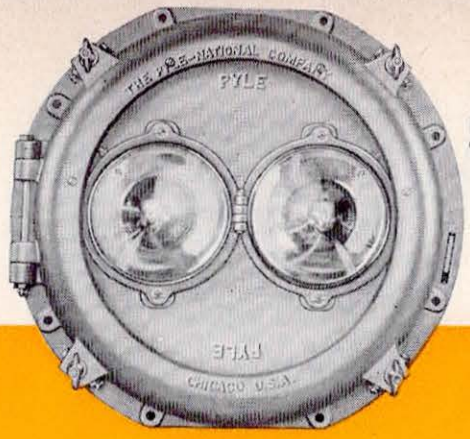
Twin Adapter, Cat. No. 14595-S mounted in standard 14-inch Pyle headlight for Steam Locomotives.

Over half a century

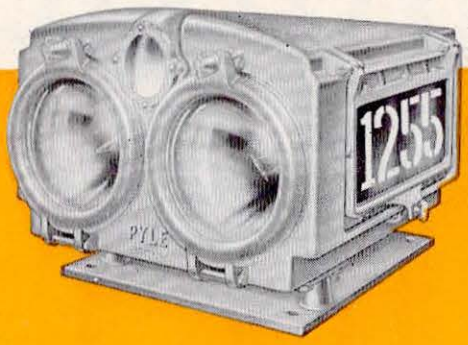
THE

SINCE 1897

GYRALITES • GAUGE, CLASSIFICATION AND MARKER LIGHTS • TURBO-GENERATORS • TRAINWIRE CONNECTORS



Flush Twin Sealed Beam Headlight, Cat. No. C-185 for Diesel Locomotives.



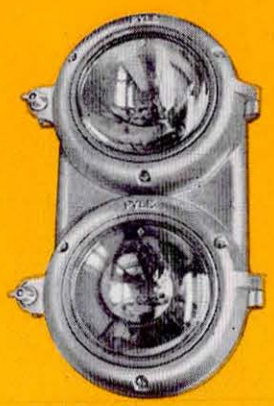
Twin Sealed Beam Headlight, Cat. No. C-1255-S for Steam Locomotives.

.BACK-UP LIGHTS

.Rapid Lamp Changeout

A Complete line of headlights and back-up lights

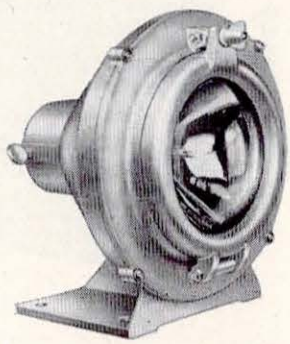
for all types of Steam and Diesel Locomotives especially designed for Sealed Beam lamps. Rugged, quality construction capable of withstanding the most severe vibration tests is combined with simple lamp retaining assembly which permits easy rapid lamp changeout without the use of tools.



Semi-Flush Twin Sealed Beam Headlight, Cat. No. 14585-ED for Diesel Locomotives with restricted mounting space.

Sealed Beam Back-Up light, lamp mounting within body, Cat. No. TSLC-2288-S.

Sealed Beam Back-Up light, lamp mounting in door, Cat. No. TSLC-220-SB. Door assembly, Cat. No. TSL-85-SBC can be furnished less body for flush mounting.



Sealed Beam light for Back-Up or Track Inspection, Cat. No. 10455. Adapter only, Cat. No. 10585-S.

See the **PYLE GYRALITES AT THE CHICAGO RAILROAD FAIR**

of specialized experience in Railway lighting equipment.

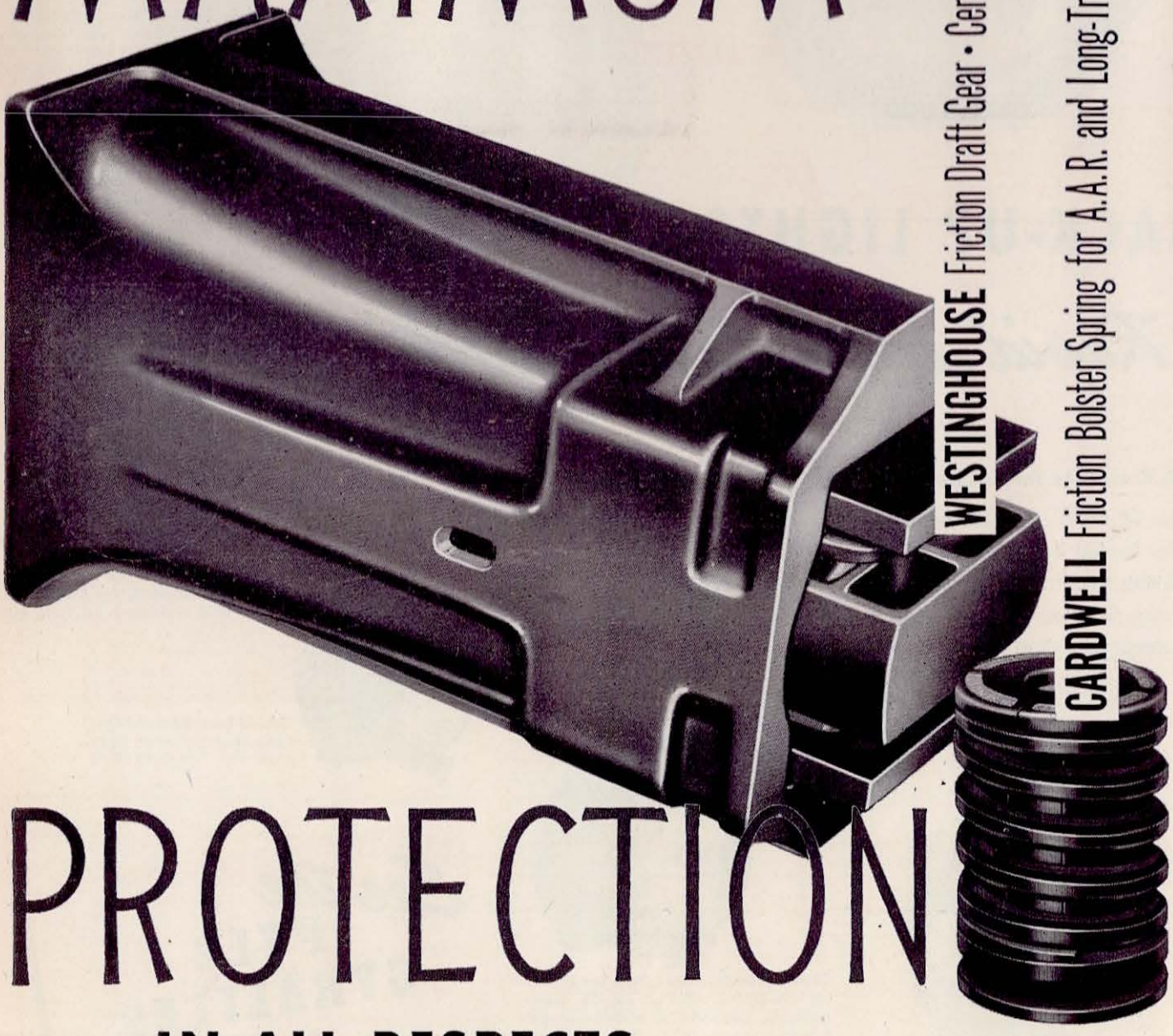
PYLE - NATIONAL COMPANY

1356 NORTH KOSTNER AVENUE • CHICAGO 51, ILLINOIS

BRANCH OFFICES and AGENTS in the principal cities of the United States and Canada. EXPORT DEPARTMENT: International Railway Supply Company, 30 Church Street, New York. CANADIAN AGENT: The Holden Company, Ltd., Montreal.

FLOODLIGHTS • PLUGS AND RECEPTACLES • CONDUIT FITTINGS • MULTI-VENT LOW VELOCITY AIR DIFFUSION

MAXIMUM



WESTINGHOUSE Friction Draft Gear • Certified A.A.R.

CARDWELL Friction Bolster Spring for A.A.R. and Long-Travel Springs

PROTECTION

IN ALL RESPECTS

Cardwell and Westinghouse shock-absorbing devices protect rolling stock against excessive horizontal, vertical, lateral and angular forces. They are designed with a high factor of safety, resulting in capacities well above the requirements.

Over 98% of the cars in freight carrying service are A.A.R. construction and over 96% have Friction Draft Gears.

Cardwell Westinghouse Co., Chicago
Canadian Cardwell Co., Ltd., Montreal

2711

How to make your rolling stock declare extra dividends

—**DIVIDENDS** that the appearance of your freight equipment can win for you in the public's eye.

—dividends that go beyond your trackage to parts of the country where freight cars are often the chief means of displaying your company name . . . and of reflecting the soundness and progressiveness of your organization.

Well aware of the fact that *appearance* does count, many railroad men today are counting on Du Pont DULUX Railroad Finishes on their freight equipment . . . for lasting service and outstanding good looks. And DULUX lives up to this confidence. DULUX retains its high initial gloss despite years of smoke, fumes, cinders, hard knocks, and weathering. DULUX comes in a wide range of colors for instant identification. DULUX means long-term beauty with less frequent need for maintenance painting. Finally . . . and more important . . . DULUX wins the approval of millions of interested eyes! E. I. du Pont de Nemours & Co. (Inc.), Finishes Division, Wilmington 98, Delaware.

85% of America's leading railways* use DUCO lacquer or DULUX enamel on passenger train equipment.

. . . conclusive proof that the nation's railroads depend on the exceptional qualities of Du Pont DUCO and DULUX Railroad Finishes: outstanding durability and sparkling beauty with a minimum of maintenance.

**Includes Class 1 lines operating 100 or more passenger train cars.*

DU PONT
REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

DUCO-DULUX
REG. U. S. PAT. OFF. REG. U. S. PAT. OFF.
Railroad Finishes

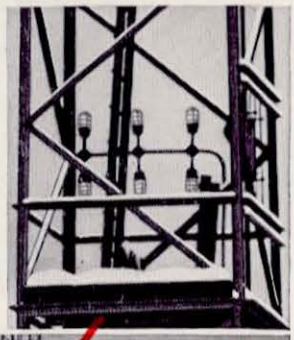
RAILROADERS"

3½¢ AN HOUR FOR POWER KEEPS SWITCHES SNOW-FREE

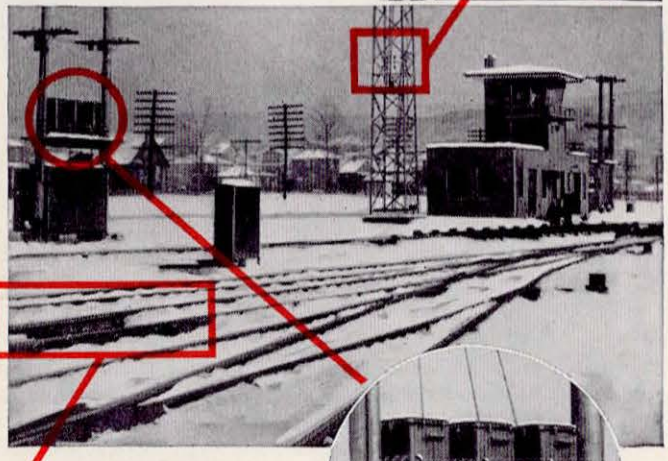
General Electric Calrod Snow Melters conquer snow easily, economically in B&O yards at Willard, Ohio.

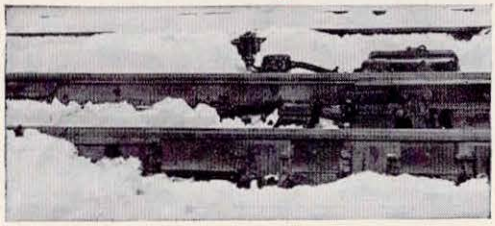
Yes, that's all it cost last winter to operate each of the G-E Calrod heaters that kept 112 switch points clear of snow and ice in the B&O classification yards at Willard, Ohio. These snow melters—part of a 2-million dollar yard modernization program that also included car retarders, power-operated switches, and floodlighting with photo electric control—played a major role in enabling the Willard yards to classify 2,300 cars per day smoothly and efficiently throughout the winter. 38,062 kwh were used at a total cost of $608.99—or an average of 3½ cents per switch point per hour of storm!

If you, too, want to combat snow the easy, electrical way, then get ready for next winter's storms by installing G-E Snow Melters *now!* We'll be glad to help you make a survey for a complete system that meets your needs. For detailed information on G-E Calrod Snow Melters check Bulletin GEA-2719. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

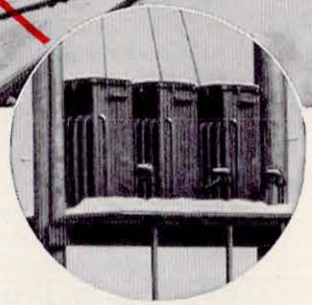


A glance at these indicator lamps tells the control tower operator whether the snow melter circuits are off, on low heat, or on high heat. Snow melters are easily adapted to automatic control, and do not interfere with the track circuits of signals.





G-E Snow Melters are easy and inexpensive to install, require practically no maintenance. They generate and dissipate heat right at the movable point.



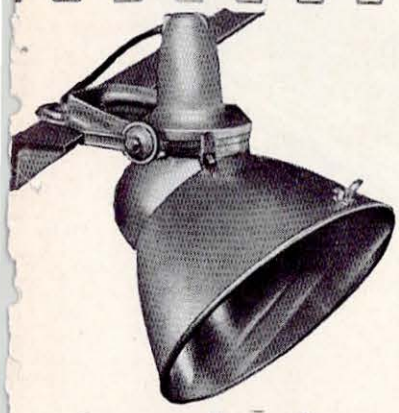
Three of the power distribution transformers used by the B&O. These transformers are rated 100 kva, 7200/12470—240/460. Together with another bank of three 200 kva transformers, they provide plenty of capacity for the 850 kw connected snow melter load.

You can put your confidence in—

GENERAL ELECTRIC

DIGEST

News and notes about
GENERAL ELECTRIC products
for the railroad industry

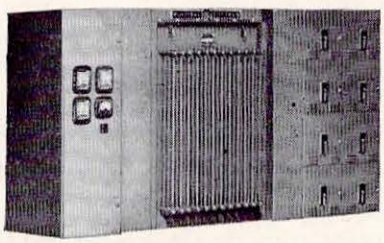


GOOD LIGHTING

speeds after-dark traffic

Darkness needn't mean a slowdown of operations in your yards if you have General Electric's type L-69 floodlights on the job. They put plenty of light right where you need it, eliminate blinding glare and deep shadow—the two most common causes of inefficient night operations. Good yard lighting also makes it easier for retarder operators to see switches, cars, and trackage—helps them judge speed and distance accurately. The L-69 floodlights give you high-efficiency lighting—and at the same time, lower initial, replacement, and maintenance costs. Write for further information.

UNIT SUBSTATIONS
Complete, Ready to Install



General Electric unit substations, in ratings from 2300 volts to 15,000 volts/600 volts and lower, come complete —shipped in two or three sections that are ready to bolt together and connect to power cables. These completely metal-enclosed substations supply power for snow melting, lighting, signaling, and shop purposes. They can be located almost anywhere—indoors or outdoors, often in space that is otherwise not being used. Because these small substations can be located close to the point of power utilization without expensive fireproof vaults, they usually enable you to cut the cost of your electric power system. They mean simplified purchasing—only one purchase transaction is required—and faster, easier installation. For more data check off Bulletin GEA-3592 in the coupon.

The BULLETIN BOARD

Write for your copies NOW!

Four new bulletins that will help you maintain and operate lightning and power equipment easier, at lower cost.

Bulletin GEA-2975D, "Distribution Lightning Arresters." Covers the major points in the protection of distribution systems and describes the features, construction, and characteristics of pellet type lightning arresters.

Bulletin GEA-3448C, "Enclosed, Indicating, and Drop-Out Fuse Cutouts." Describes the applications, features, and specifications of fuse cutouts. Explains how these cutouts solve *all* primary cutout problems.

Bulletin GEA-4521, "High Voltage Distribution Transformers." 500-kva and smaller single-phase transformers that provide unusually high insulation strength and ability to withstand repeated impulse stresses.

Bulletin GEA-3640B, "Outdoor Lighting for Industrial Plants." A new bulletin containing up-to-date information on lighting for loading platforms, work areas, storage areas, roadways, sidings, buildings, fence and protective lighting.

General Electric Company, Section A152-3
Apparatus Department, Schenectady 5, N. Y.

Please send me the following bulletins:

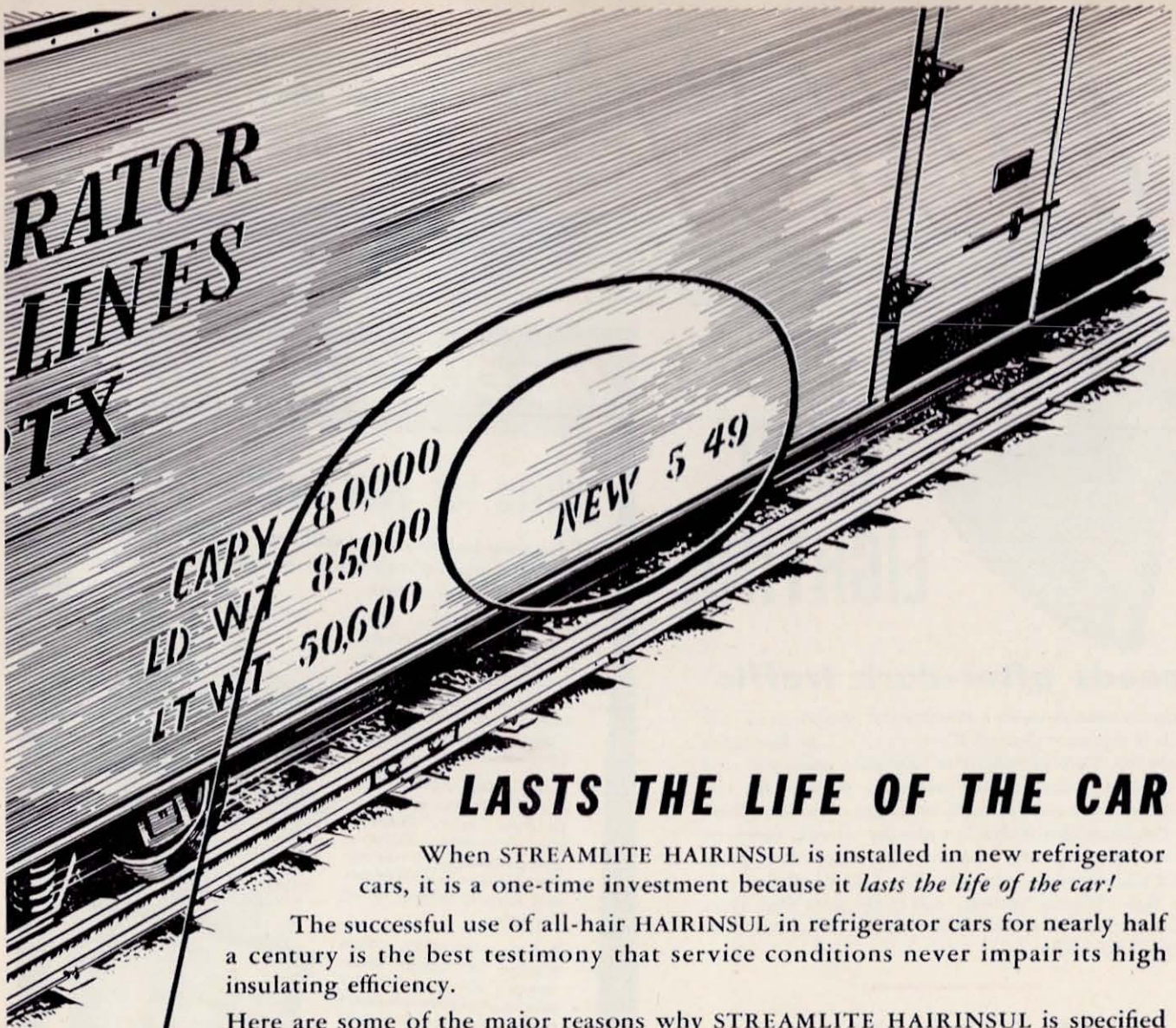
( ) GEA-2719—Calrod Snow Melters
( ) GEA-3592—Unit Substations
( ) GEA-3448—Enclosed, Indicating, and Drop-Out Fuse Cutouts
( ) GEA-2975—Distribution Lightning Arresters
( ) GEA-4521—High Voltage Distribution Transformers
( ) GEA-3640—Outdoor Lighting for Industrial Plants

Name .....

Company .....

Street .....

City ..... State .....



LASTS THE LIFE OF THE CAR

When STREAMLITE HAIRINSUL is installed in new refrigerator cars, it is a one-time investment because it *lasts the life of the car!*

The successful use of all-hair HAIRINSUL in refrigerator cars for nearly half a century is the best testimony that service conditions never impair its high insulating efficiency.

Here are some of the major reasons why STREAMLITE HAIRINSUL is specified by leading refrigerator car lines. Write for complete data.

LOW CONDUCTIVITY. Thoroughly washed and sterilized, all-hair heat barrier. Rated conductivity—.25 btu per square foot, per hour, per degree F., per inch thick.

LIGHT WEIGHT. Advanced processing methods reduce weight of STREAMLITE HAIRINSUL by 40%.

PERMANENT. Does not disintegrate when wet, resists absorption. Will not shake down, is fire-resistant and odorless.

EASY TO INSTALL. Blankets may be applied to car wall in one piece, from sill to plate and from one side door to the other. Self-supporting in wall sections between fasteners.

COMPLETE RANGE. STREAMLITE HAIRINSUL is available ½" to 4" thick, up to 127" wide. Stitched on 5" or 10" centers between two layers of reinforced asphalt laminated paper. Other weights and facings are available.

HIGH SALVAGE VALUE. The all-hair content does not deteriorate with age; therefore has high salvage value. No other type of insulation offers a comparable saving.

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handles *more* kinds of jobs more places

For over eleven years the light, portable Barco Unit Tytamper has been doing spot or gang tamping, cribbing, breaking, drilling and winter ice service. And, year after year, Barco has shown it can do *more* kinds of jobs, yet save money both on first cost and maintenance. It is not necessary to clean out cribs of "cemented" ballast before tamping if BARCO tytampers are used. For more information, write Barco Manufacturing Co., 1800H Winnemac Avenue, Chicago 40, Illinois. In Canada: The Holden Co., Ltd., Montreal, Canada.

BARCO
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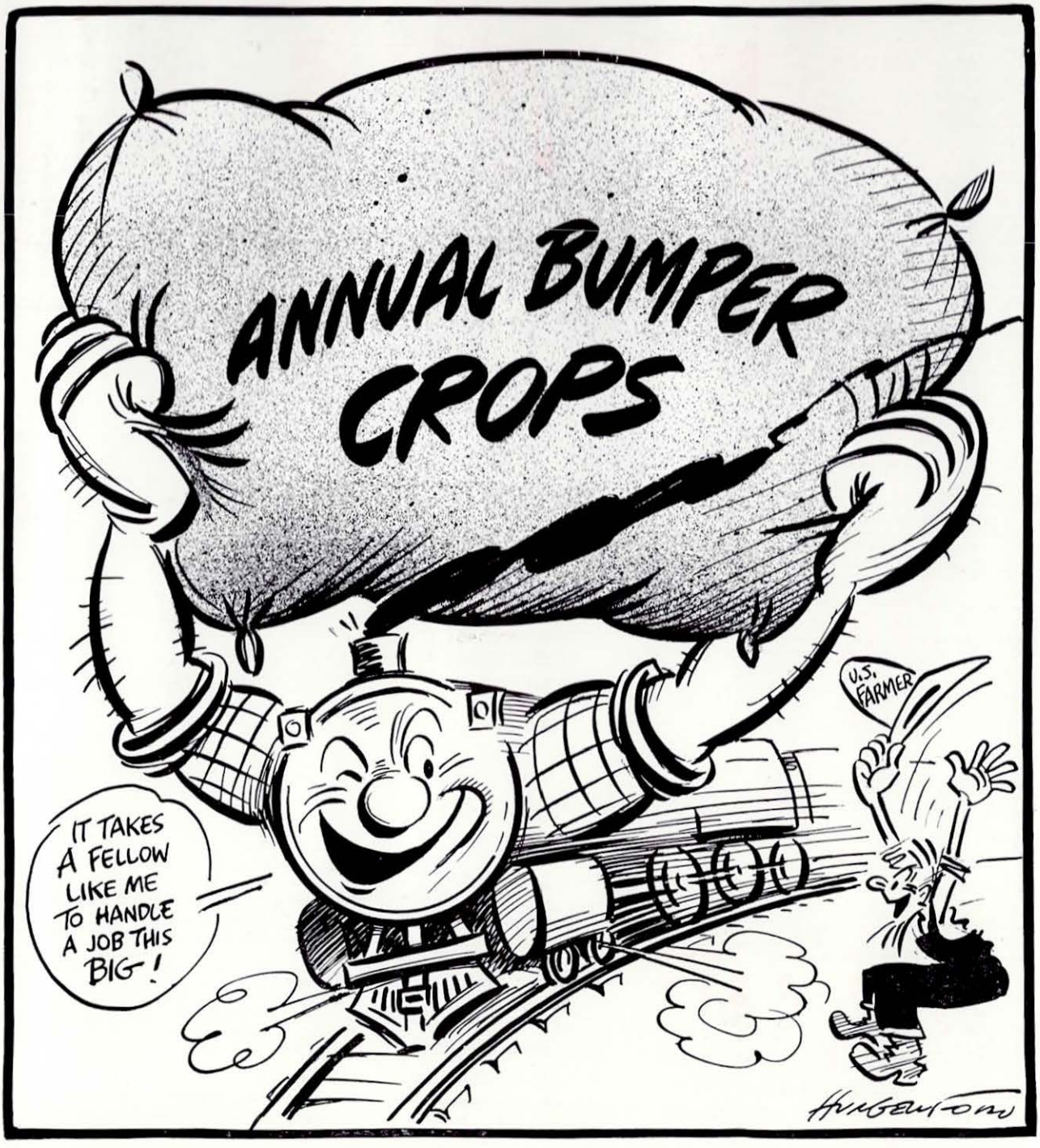
FREE ENTERPRISE—THE CORNERSTONE OF AMERICAN PROSPERITY

A Friend in Need —By Hungerford



Watch for other railroad cartoons by Mr. Hungerford

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Address requests to:

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P. O. Box 478, Pittsburgh 30, Pennsylvania.

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BARCO
UNIT TYTAMPERS

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TODAY'S PIO

So that all may ACTUALLY SEE its opportunities for savings in fuel, for savings in weight—for unequalled economies in construction, operation, and maintenance . . .

So that all may BETTER PICTURE its swifter acceleration—its surprising ability to take curves at high speeds—the chance to slash running times on both short and long runs . . .

So that all may TRULY KNOW its exciting passenger appeal—tremendous revenue potential . . .

So that all may consider, FIRST HAND, the merits of its revolutionary and unique articulated design . . .

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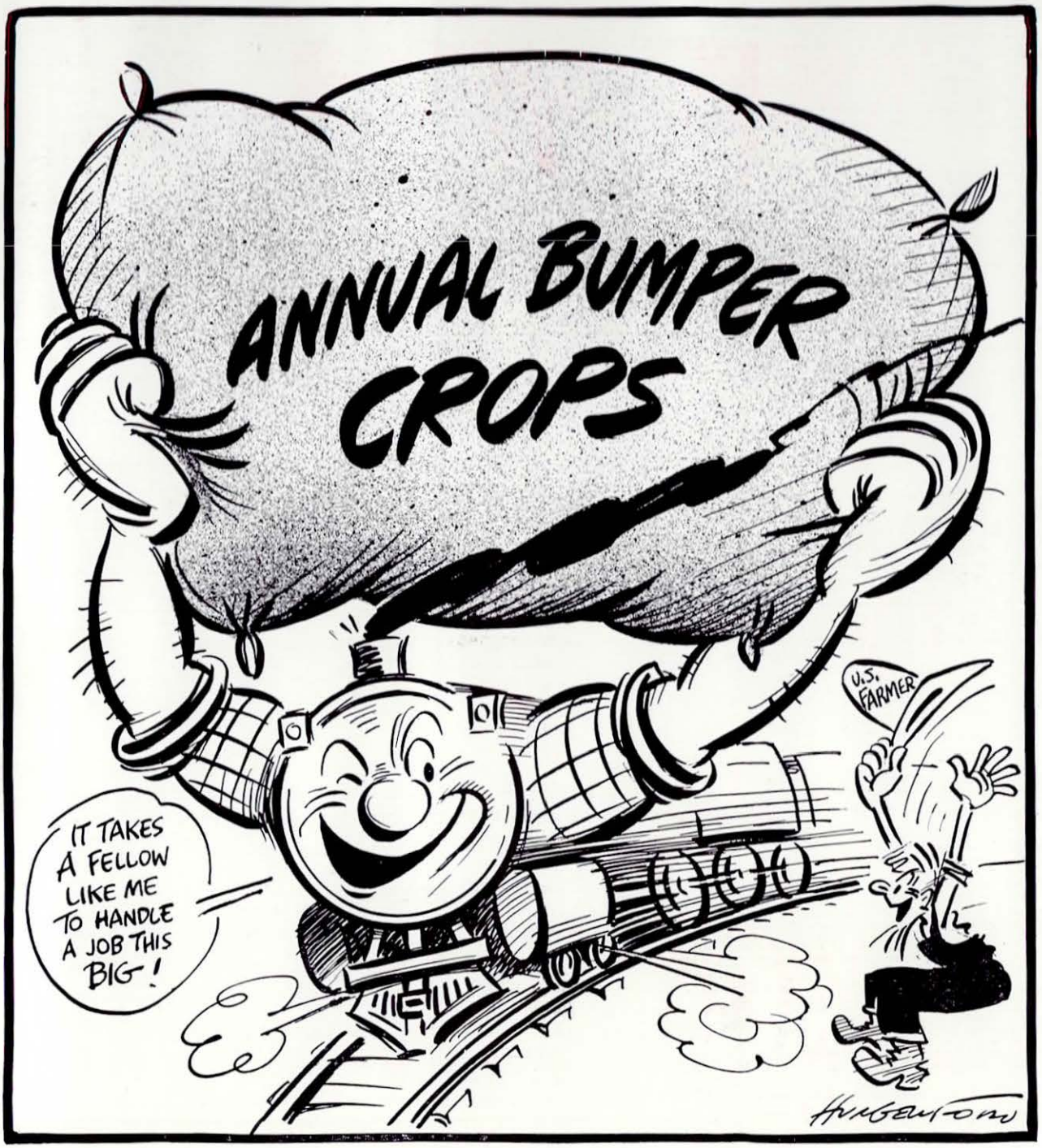

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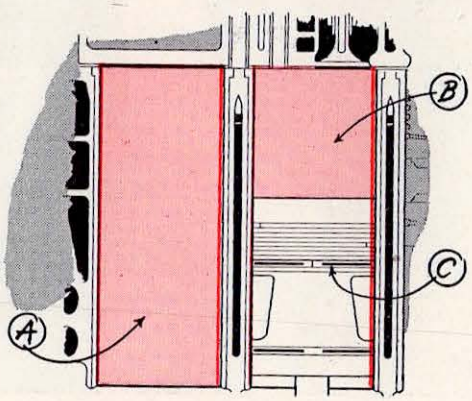
STANDARD ENGINEER'S CASE FILE

Case D119E—Reducing Wear on Liners in Diesels



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In high-speed Diesel engines lubricated with RPM DELO Diesel Engine Lubricating Oil, wear on liners was held to a minimum with little variation over their entire areas. A constant lubricating film was maintained on them even in high-temperature belts. RPM DELO Oils are recommended for all types of Diesels. Come in all viscosity grades necessary for your engines.

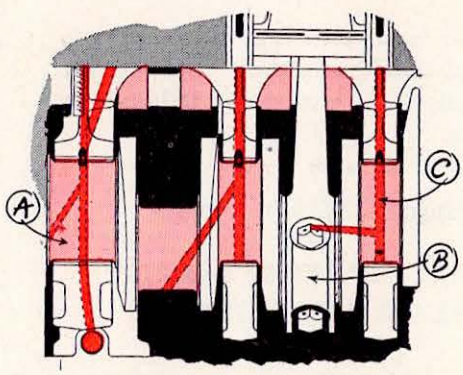
A. Special additive provides metal-adhesion qualities...keeps oil on all parts whether hot or cold, running or idle.

B. An anti-oxident resists formation of lacquer—resistance to extreme heat provides lubrication in the toughest conditions.

C. Contains detergent which keeps rings clean and operating freely...prevents scratching and gouging of liners.

RPM DELO Diesel Oil will not corrode any bearing.

Case D119F—Prolonging The Lives of Diesel Bearings



SECTION OF DIESEL ENGINE CRANK AND CAM

No bearing failures occurred between overhaul periods in Diesel engines used in the toughest service when they were lubricated with RPM DELO Diesel Engine Lubricating Oil.

A. Non-corrosive to all types of bearing metal...inherent ability of base stocks and added compound resist oxidation and formation of acid which is common cause of bearing corrosion.

B. Maintains a tough lubricating film which withstands excessive shocks and pressures.

C. Special detergent compound keeps oil passages clean and open - allows free flow of lubricant to vital points.

Another compound in RPM DELO Oil prevents foaming of the oil. An accurate measurement of crankcase levels can always be obtained.

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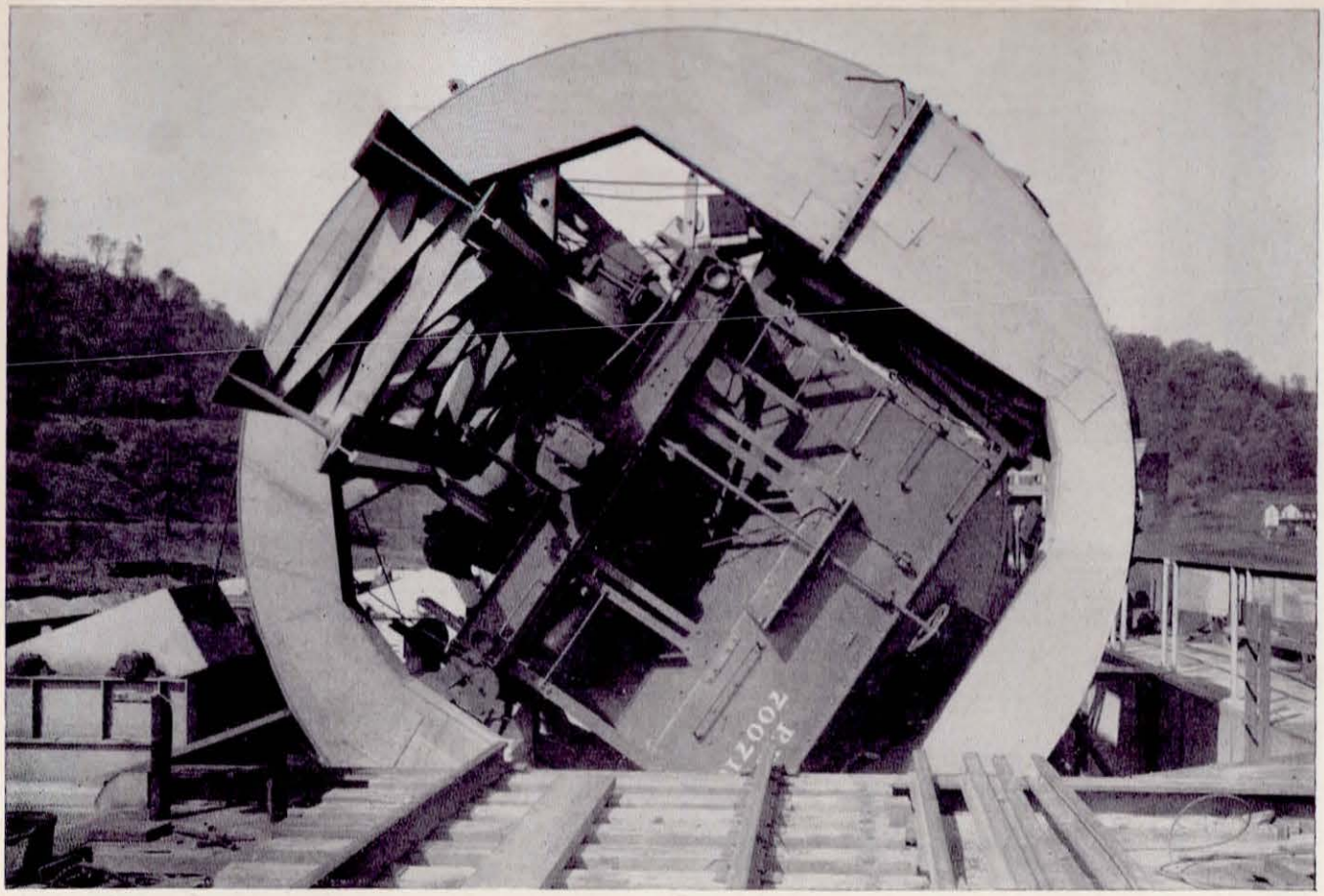

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EFFICIENT
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The Eastern Car Dumper design offers the only real advancement in railroad car dumping equipment in years. With this lightweight, compact mechanism, the complete dumping cycle requires only 90 seconds, starting with the loaded car in an upright position, tilting **a full 180 degrees,** and returning empty to normal position—ready for spotting of the next loaded car. No side-shifting of the car is necessary, and a new supporting arrangement allows automatic adjustment of the dumper to any width railroad car.

For speed, ease, and low-cost operation, you'll find that the Eastern Car Dumper fits perfectly into your material handling operations.

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RAILWAY CAR ROTARY DUMPERS
MINE CAR ROTARY DUMPERS
CAR SHAKERS
Fabricators of SPECIAL WELDMENTS,
MINE STRUCTURES AND EQUIPMENT

Write for Bulletin No. 847.

EASTERN CONSTRUCTORS, INC.
POLAND, OHIO PLANT, WARREN, OHIO

This Locomotive Leads a *Double* Life

Hauling 10,000 tons of stone daily . . . up steep grades, around sharp curves, over temporary trackage . . . should be job enough for any two locomotives. Yet two of these 1,500 hp. Fairbanks-Morse locomotives perform this service for the Monon . . . *and* make a nightly freight run, returning just in time for another full day in the quarries.

Here is another example of how Fairbanks-Morse top availability solves operational problems . . . and allows fullest utilization of diesel locomotive equipment. Fairbanks, Morse & Co., Chicago 5, Ill.

FAIRBANKS-MORSE,

a name worth remembering

DIESEL LOCOMOTIVES • DIESEL ENGINES • PUMPS • SCALES • MOTORS • GENERATORS
STOKERS • RAILROAD MOTORCARS and STANDPIPES • FARM EQUIPMENT • MAGNETOS

For smoother, faster going –

THE NEW HOUDAILLE FRICTION SNUBBER*

Here is the new Houdaille Friction Snubber...a simplified railroad shock absorber for either vertical or lateral control.

Extensive tests show an extremely long life for this unit. It is self-compensating for wear and can be maintained easily by present railroad personnel without special training.

While designed for use on all suspensions, the new Houdaille Friction Snubber is particularly suitable for the "soft" springs desirable for higher speed freight operation. Present models have been proven effective in controlling the new long-travel springs.

Full information covering this new development will gladly be sent on request.

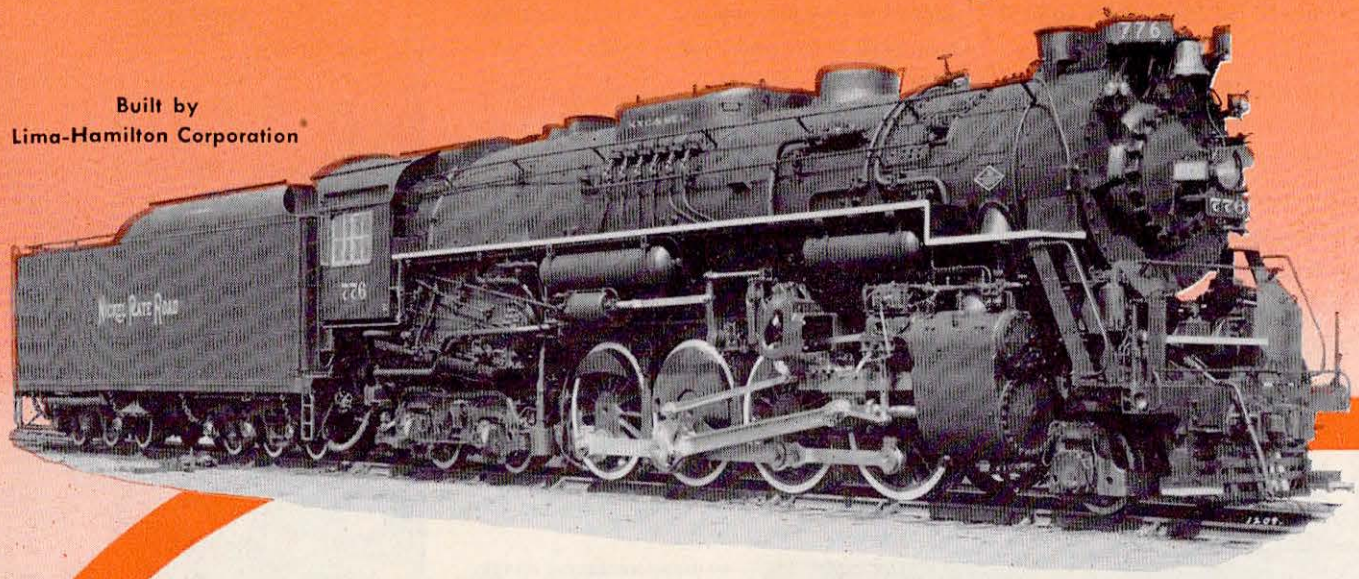
HOUDAILLE-HERSHEY CORPORATION
HOUDE ENGINEERING DIVISION
BUFFALO 11, NEW YORK
America's Pioneer Builder of Hydraulic Shock Absorbers

**Say-"Hoo-dye"*

More New Steam Locomotives

for Nickel Plate Fast Freight Service

Built by
Lima-Hamilton Corporation



Equipped with COMMONWEALTH

- Locomotive Beds
- Water-Bottom Tender Frames
- 2-Wheel Engine Trucks with outside journals
- 4-Wheel Trailer Trucks

Ten new, modern 2-8-4 type steam locomotives for fast freight service have recently been delivered to the N.Y.C.& St.L. This is the Nickel Plate's sixth order in recent years for locomotives of this type.

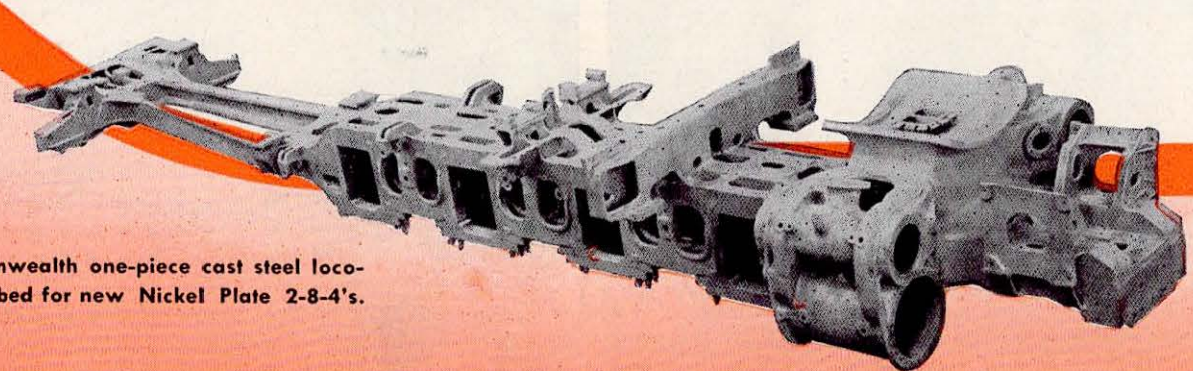
Comparative tests made with steam locomotives of this type now in service on the Nickel Plate showed such efficiency and economical performance that additional freight locomotives of the same design were ordered.

Again, one of America's important railroads specified COMMONWEALTH one-piece cast steel products to assure more efficient operation, lower maintenance costs and highest locomotive availability for ***active, productive, profitable*** service.

Specify COMMONWEALTH LOCOMOTIVE PRODUCTS for your ***new*** or ***existing*** steam power to reduce upkeep costs.

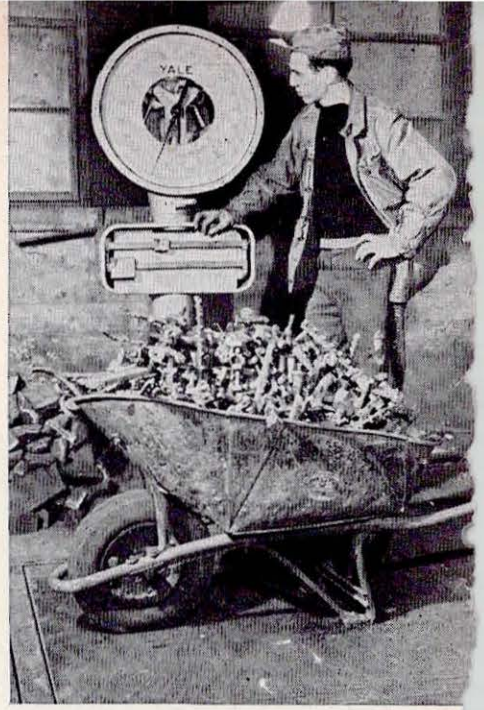
GENERAL STEEL CASTINGS

Granite City, Ill. Eddystone, Pa.



Commonwealth one-piece cast steel locomotive bed for new Nickel Plate 2-8-4's.

KEEP ROLLING STOCK ROLLING . . . economically!



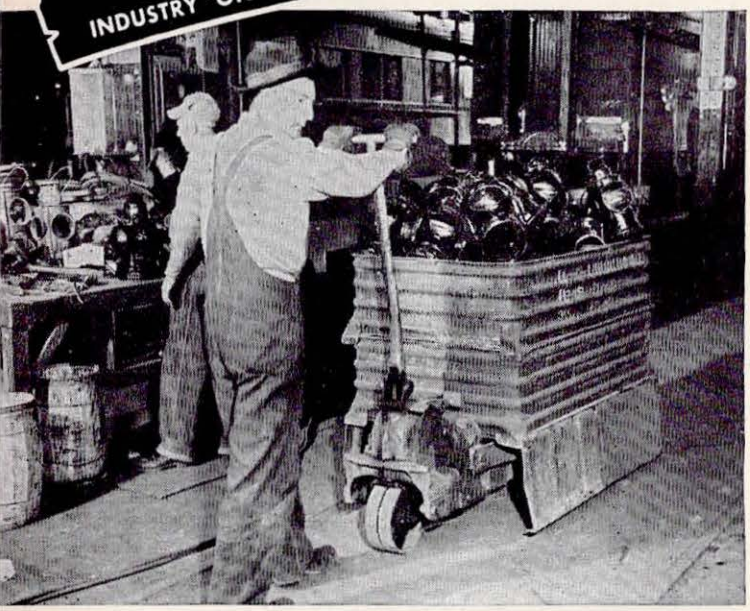
Railroading is a business of movement. Equipment maintenance and repair jobs demand that parts be lifted and moved scores of times. Stores are constantly flowing in and out of inventory. L. C. L. freight is practically always in motion. Fast, accurate weighing is essential.

All of which proves that to keep rolling stock rolling *economically* demands top efficiency in handling operations. Yale Hoists, Hand Lift and Power Trucks, and Scales are giving many railroads real cost-cutting performance every day. Wherever they are used, time is saved, human energy is conserved, safety for men and materials reaches new high levels and costs tumble.

Investigate the big opportunities for permanent economies that Yale Material Handling Machinery can bring to *your* line. The nearby Yale representative will gladly give you the benefit of his many years of experience in cutting costs for railroads. Write him today or send your request direct to Yale.

YALE
TOOLS THAT KEEP INDUSTRY "ON THE MOVE"

THE YALE & TOWNE MANUFACTURING CO.
Department L-61
Roosevelt Boulevard · Philadephia 15, Pa.



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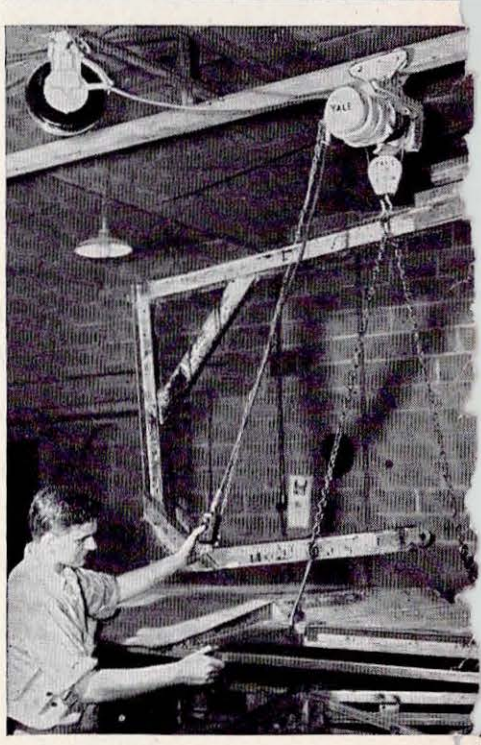
Robert J. Wylie
612 Pioneer Bldg.

WASHINGTON 5, D. C.
Ralph W. Payne,
Metropolitan Bank Bldg.



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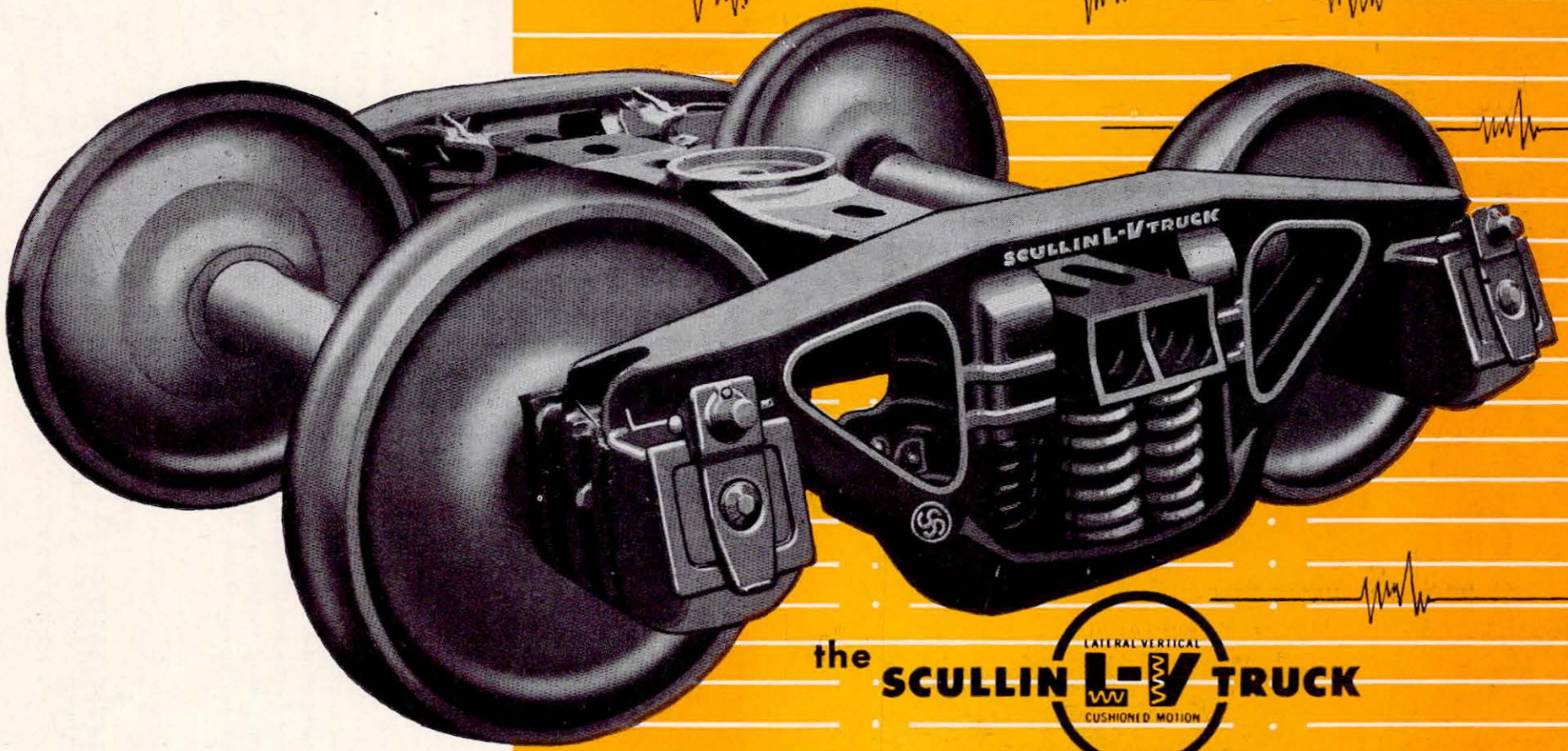
MATERIAL HANDLING MACHINERY · *hoists . . . hand and electric* · *trucks . . . hand lift and power* · *industrial dial scales*

dominates the ROUGHEST RAILS!



the SCULLIN L-V TRUCK

LATERAL VERTICAL CUSHIONED MOTION

smooths the way for faster freight

50 YEARS' PROGRESS

SCULLIN STEEL CO.

SAINT LOUIS 10, MISSOURI

NEW YORK • CHICAGO • CLEVELAND • BALTIMORE • RICHMOND, VA. • MEXICO CITY, D. F.

Suppose YOUR Share of the yearly railroad freight came all at once

You'd need a warehouse to store it and a fleet of trucks to move it, if your proportionate share of the freight originated yearly on Class I American Railroads were delivered to you at one time.

You'd get 2200 pounds of potatoes, wheat, corn and other produce . . . 272 pounds of meat . . . over 11,000 pounds of mine products . . . 5600 pounds of manufactured items. And the railroads would have hauled all this an average distance of 425 miles!

Fortunately, you don't have to take your share all at once. For the railroad organization, operating with remarkable efficiency, transports it piece-meal, to cities, towns, and hamlets all over the nation. On many items, daily delivery schedules must be—and are—maintained!

The steadily increasing load on the railroads is being handled by use of improved equipment and efficiency of operations. Each forward step has demanded new developments in brakes. Thanks to a continuous research program, now in its eighth decade, Westinghouse Air Brake equipment to meet each new need has always been ready.

Westinghouse Air Brake Co.

WILMERDING, PA.

To Direct popular attention to the remarkable achievements of American Railroads, this advertisement has been run in national media by Westinghouse Air Brake Co.

Vol. 127, No. 5 July 30, 1949

RAILWAY AGE

With which are incorporated the Railway Review, the Railway Gazette, and the Railway-Age Gazette. Name Registered in U. S. Patent Office and Trade Marks Office in Canada.

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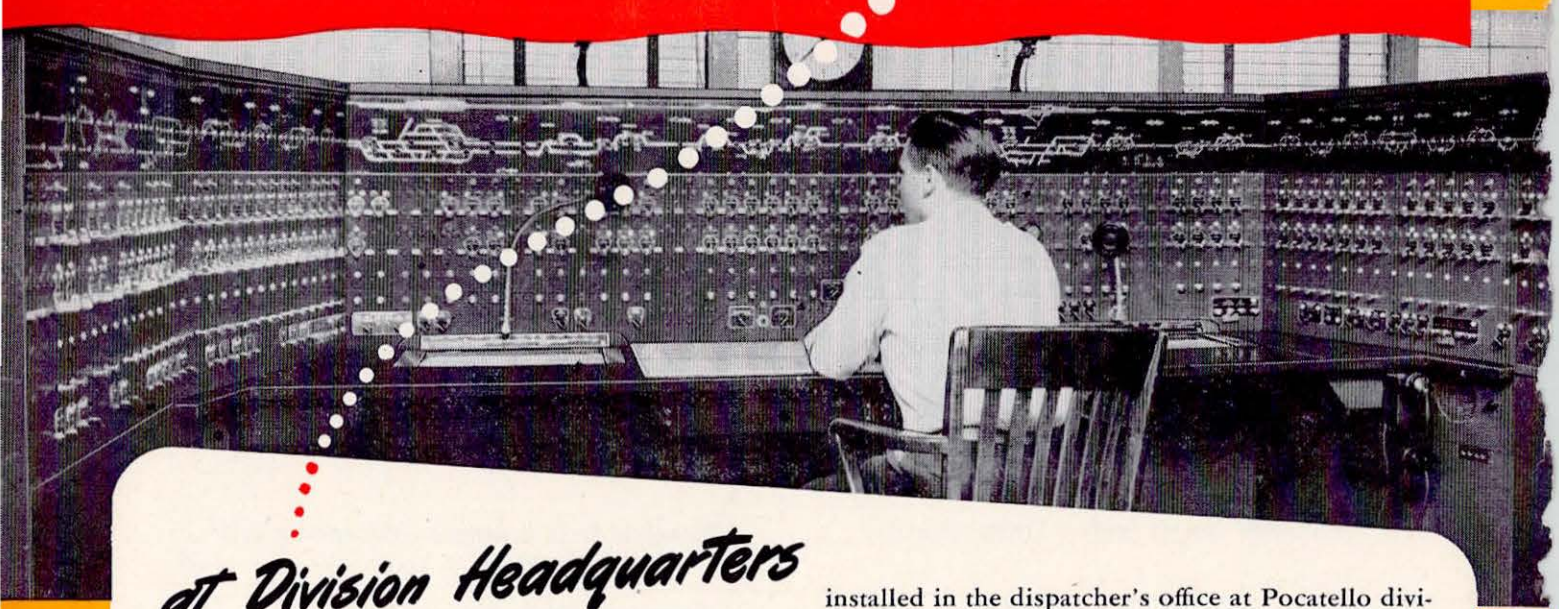
concentrates control

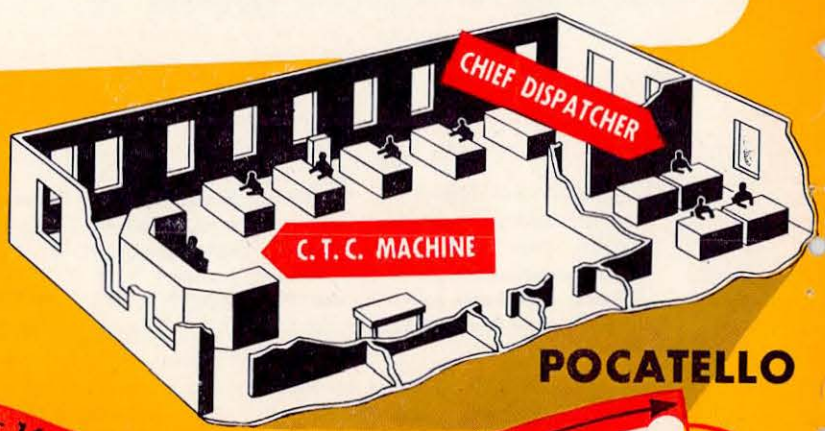


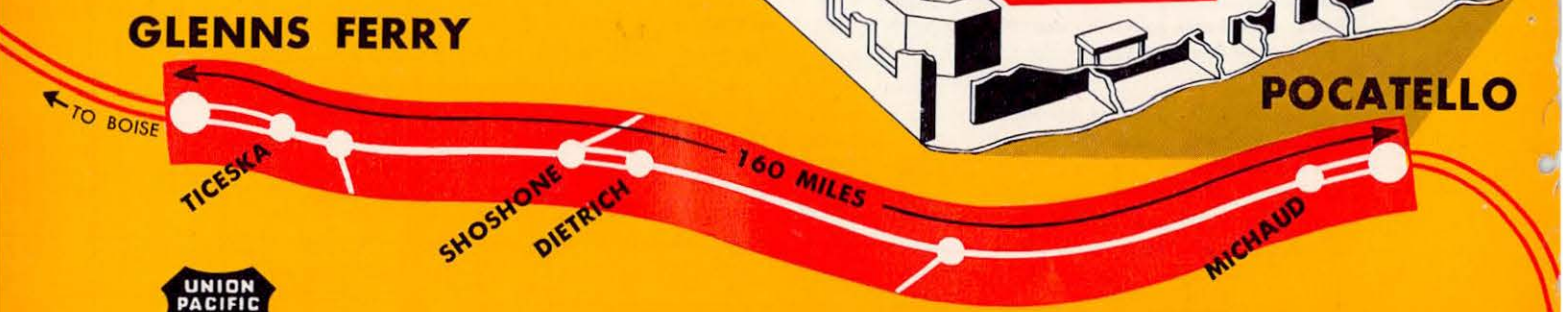
at Division Headquarters

Consistently heavy through freight traffic . . . considerable local work . . . heavy traffic to and from branch lines . . . seasonal peaks at harvest times . . . these were the problems which led the Union Pacific to install "Union" C.T.C. on the 160-mile territory between Pocatello, Idaho and Glenns Ferry.

To obtain *maximum* benefits from this modern method of train operation, the control machine was installed in the dispatcher's office at Pocatello division headquarters. From here, train movements are directed by signal indications over the busy C.T.C. territory . . . trains are kept moving with minimum stops and delays . . . congestion is eliminated.

Most important, this *concentration of C.T.C. control at division headquarters* permits coordination of main-line, branch-line, and yard operations on a division-wide basis for maximum efficiency.





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WEEK AT A GLANCE

MECHANIZED MAINTENANCE: With the advent of the 40-hour week now only a month away, the problem of finding means to offset the increased costs which will accompany it must necessarily be a major objective of all railroad departments. In maintenance-of-way work, at least, one of the most promising solutions of that cost problem is greater mechanization—substitution of machine power for manpower. What one road—the Pennsylvania—is already doing in that direction is interestingly told by our Western editor, Neal D. Howard, in the article which begins on page 34. The article is, in effect, the unofficial "minutes" of a 400-mi. inspection trip over some of the P.R.R.'s busiest main lines by the American Railway Engineering Association's Committee on Economics of Railway Labor.

MONEY—AND A WAY TO GET IT: Another major railroad problem—one which, in the long run, is even more formidable than that of meeting higher costs resulting from the 40-hr. week—is the question of how and where to find capital funds with which to make necessary improvements in fixed facilities—track, yards, shops, signals, etc. A possible solution to that problem is proposed on page 50 by Frederick C. Fiechter, Jr., an officer of the Pennsylvania Co. for Banking & Trusts, in an article which deserves the careful attention of top railroad executives and financial officers. Mr. Fiechter not only outlines a definite plan for fixed-plant financing, but states its advantages and disadvantages with unusual objectivity. We hope his study will at least stimulate discussion of this pressing problem.

MOTOR-GENERATOR ELECTRICS: Beginning on page 42 is an abstract, illustrated, of a paper recently presented to the A.S.M.E. in San Francisco, describing the capabilities of motor-generator type electric locomotives as demonstrated in heavy grade service on the Great Northern and the Virginian.

FIRST IMPRESSIONS: Bill Schmidt, our transportation editor, has probably ridden over as many different miles of railroad track as any man in the United States. We suspect, in fact, that he has covered at one time or another almost every rail line in this country. At any rate, he's looking for new worlds to conquer—which, in Bill's case, means new trains to ride. So he is over in England—and his first impressions of the British railways under their new national ownership are outlined in a letter printed in this issue, beginning on page 46.

HAVE A GOOD TRIP? Because people so often magnify the "little things," the riding qualities of railroad passenger cars may well have a greater influence than is generally realized, not only on the volume of passenger traffic but on the travelling public's whole attitude toward railroads. At any rate, luxurious interiors and colorful decorations won't always compensate for a rough trip—whether the cause of the roughness be in the car, the track or the handling of the train. The various factors that affect riding qualities were analyzed by the New Haven's Kenneth Cartwright in a recent talk to the Railroad Enthusiasts at New York, and his remarks are abstracted at page 39.

"HALF STRIKE" HITS CAR LOADINGS: John L. Lewis' arrogant use of his dictatorial, monopolistic power to put the country's coal miners on a three-day week—or "half strike"—is having the natural and inevitable result of reducing car loadings of coal. This fact, and many others, are brought out in our News report of the latest monthly summary of the national transportation situation by Arthur H. Gass, chairman of the Car Service Division of the Association of American Railroads.

"ROLLING LAB": Electro-Motive's new engineering test car, which is provided with electrical equipment to check all phases of Diesel locomotive performance under actual service conditions, is described and illustrated on page 53.

STRANGE BEDFELLOWS: As reported in the News section, the I.C.C. has authorized the Railway Business Association to intervene, on the side of the railroads, in the so-called reparations cases; the R.B.A has explained its intervention in a strong statement also summarized in the News. So far as we know, the Communist party is about the only organized group which is supporting the Justice Department's effort to ruin the railroad industry. Politics does indeed make strange bedfellows!

N.Y.C. COORDINATES RAIL AND TRUCK SERVICE: On page 48 is an illustrated account of the New York Central's new coordinated rail-truck service, which utilizes the advantages of both rail and highway transportation to provide 400 Illinois, Indiana and Ohio communities with fast, reliable merchandise service.

A LESSON FROM THE ARMY: With 10 million, more or less, ex-G. I.'s scattered all over the country, jokes about the Armed Forces and their alleged "inefficiency" have been pretty common. Some of the jokes may have some foundation—but the fact remains that our Armed Forces still did a marvelous job, all over the world, in winning history's greatest war; and did it in spite of the neglected "poor relation" status they normally occupy in time of peace. One of the reasons for their success was good staff work. There's a lesson there for all industry, but particularly for the railroads, in these days when social, political and labor problems loom so large. Our leading editorial (page 31) explores that question in more detail.

The New General Motors F7

hauls up to

33% more tonnage

– and does it with no increase in traction-motor temperature rise and with substantial increase in motor life.

Reason? New Electro-Motive developed traction motor

–inorganic insulation

–better cooling

–heavier power cable

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DIVISION OF
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"STAFF WORK" AND THE FUTURE OF PRIVATE OWNERSHIP

There is nowhere except in the enormous strategic operations of great modern military organizations that large industries—particularly the railroads—can find a counterpart to the complex and baffling social and technological problems which confront them. Railroading in this country was in considerable measure an outgrowth of its military establishment, and a good many railroad men continue to be students of military strategy, as an avocation. It should be helpful if more of them would take up this pastime, and would endeavor to translate what they learn into terms of railroad management, wherever applicable.

"Captains of Policy" Needed

Winston Churchill became First Lord of the Admiralty late in 1911. His report of conditions as he then observed them in the British Navy bears a remarkable resemblance to conditions in the transportation industry in America in 1949. He writes:

"When I first went to the Admiralty I found that there was no moment in the career and training of a naval officer when he was obliged to read a single book about naval war, or pass even the most rudimentary examination in naval history . . . 'The Silent Service' was not mute because it was absorbed in thought and study, but because it was weighted down by its daily routine and by its ever complicating and diversifying technique. We had competent administrators, brilliant experts of every description, unequalled navigators, good disciplinarians, brave and devoted hearts: but at the outset of the conflict we had more captains of ships than captains of war."

Today in the railroad business, what opportunity is given to "captains of railroads" to engage in the study and reflection required to enable them to be "captains of industrial, economic and political policy"? Quite apart from attention to their primary duties as "competent administrators" and "brilliant experts," most of them are required to spend many weeks out of each year in preparing and presenting testimony to legislators and regulators, in the hope of imparting to amateurs sufficient information to enable them to arrive at decisions on policy questions which, in other industries, are made by management itself. The difficulties of developing comprehensive and long-term strategy for the railroad industry present, thus, even more perplexing a problem than Churchill faced at the beginning of his brilliant career as a war lord. The great military organizations on both sides of the Atlantic, in the thirty years which followed Churchill's initiation into these affairs, have largely made good the deficiency in the "general staff" activity which he noted—else subsequent military campaigns of constantly increasing

intensity could never have been so effectively managed as they were.

The need for taking counsel—based on full knowledge of intricately complex political, economic and technological developments—is certainly no less imperative today for leaders of great industry, especially the railroads, than the similar need in military circles has been for almost four decades. If the lumbering military bureaucracies can encompass and digest the enormous amount of information required for successful strategy in modern warfare, as they have done, then certainly the more efficient organizations of industry could at least equal this accomplishment in the field of long-term political, economic, and "human relations" strategy, wherein *all* the really baffling problems of management—especially railroad management—lie.

The Secret of Effective Staff Work

The secret of effective staff work, of course, lies in the widespread delegation of authority and responsibility to competent subordinates. Put more bluntly, this prescription may be expressed as: *Make the young fellows work harder and at more different jobs than you ever did;* and give them more opportunities for education than you ever had. This is not a counsel of cruelty but of kindness—because, with the enormous increase in the complexity and power of the forces now waging war on private enterprise, especially in transportation, nothing short of the largest available supply of trained brains can hope to cope successfully with the problem. It is in the qualities of leadership and understanding which are instilled now into the few hundred young men destined in the next decade to take over the major direction of the railroad business that the hope for the future of the business largely depends—and probably that of general economic freedom as well.

Churchill, in his history of the first World War, goes on to reveal how the ill-fated Gallipoli campaign was bungled in its preparation because "the general staff was completely in abeyance"—the War Secretary (Lord Kitchener) had learned his trade in small-scale operations and he tried to do personally all the "staff work" for large-scale operations. Big as his brain was, it wasn't that big.

A large railroad today—and the industry as a whole—cannot hope to obtain or retain an "optimum" position in the complex life of the nation without appropriating and making active use of a lot more information than it is possible for any one man, even a genius, to absorb and manipulate. An executive is so busy attending to the duties that are urgent that many things of greatest importance inevitably escape his attention, unless they are given as special assignments to competent men and *unless the information such men acquire is incorporated into policy.* This second requirement is most important and is the place where a lot of excellent "staff work" (e.g., much of that done by the Railroad Committee for the Study of Transportation) fails to bear adequate fruit.

The railroads have many highly competent hands at presenting testimony to various labor boards—because external circumstances have given them great experience in this activity. They have not acquired similar expertness in the kind of personnel work which prevents labor disputes from developing, because such activity, despite its high importance, never clamors for attention. A railroad man—K. C. Ingram—of the Southern Pacific—has written a valuable book on human relations, "Winning Your Way with People." How many railroads *require* reading of that kind on the part of their supervisory forces and by employees with public contacts?

Then there is the whole matter of collecting, analyzing, studying, and *acting upon* the available information regarding the inroads of competition which is aided by public funds. After many years of grumbling about this situation, the railroads in at least one of the geographical territories have now got down to serious study of one phase of this all-important problem; but the industry as a whole has quite a way to go still before it can be said that the field has been adequately covered, and that the information to be acquired is actually going to enter into top-level policy-making.

Three Objectives of Staff Work

There are really three objectives in the attention to "staff work" which the railroads need, viz.: (1) Getting into the policy-making picture a lot of vitally significant economic, social, and technological information which is now omitted from consideration; (2) stretching the minds and the imaginations of younger railroad officers by requiring them to master a wider variety of jobs than their predecessors have done, thus increasing their alertness and resourcefulness, and (3) giving top management of the industry the widest possible knowledge of the environment in which the industry is living, with the end in view of getting the best "break" possible out of that environment.

Arthur Krock, Washington correspondent for the New York Times, recently wrote at length on the superior "public relations" and manipulative skill of left-wing and semi-subversive groups, over that of leaders of the nation's constructive forces. It is not a case of brains *versus* brawn with the brains all on the pink side—but the fact that people doing other things besides talking have been too busy to organize themselves for effective action in the political and social realm.

Getting such organization is not insuperably difficult, once the need for it is recognized; and nothing could be more perilous than its continued neglect, especially for the railroads, which are half-way in the clutches of socialization already.

Maintenance — Pennsylvania Style

Road affords Committee on Economics of Railway Labor, A.R.E.A panorama, via train and bus from New Brunswick, N. J., to Pittsburgh, of its highly-organized machine methods

By NEAL D. HOWARD
Western Editor
Railway Age

E. Kirby, cost engineer of the Chesapeake & Ohio. J. L. Gressitt, chief engineer of the P. R. R., and S. R. Hursh, assistant chief engineer-maintenance, P. R. R.

The party first made two stops to examine sections of the deep ditching, many miles of which adjoin the wide roadbed of the New York division, for the purpose of lowering the high watertable in this area and adding stability to the track substructure.

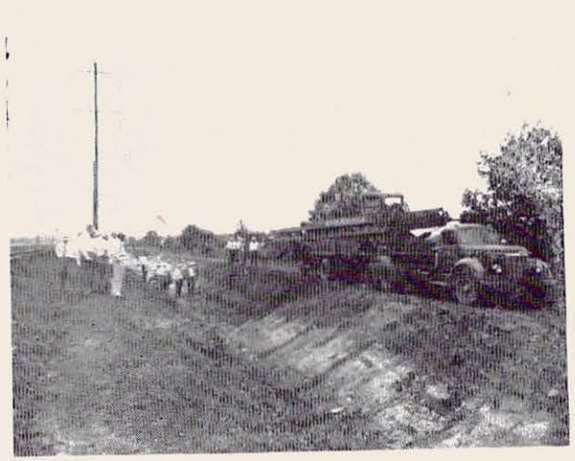
At Howes Lane, N. J., work was about half completed on a project to provide a mile-long ditch, 7 to 9 ft. deep, far enough from the rails to provide a 20-ft. track shoulder. To complete this work, which will involve the moving of approximately 25,000 cu. yd. of earth and shale, the road—with company forces and equipment—is using a ¾-yd. dragline bucket and crane; a 100-hp. crawler tractor equipped with angle-dozer and winch; a Gradall ditching machine; several 5-ton capacity dump trucks, and a 160-cu. ft. air compressor to operate demolition tools. Previous experience with such ditches assure that this one will accomplish the drainage desired, and the committee was told that this particular job will not exceed 75 to 80 per cent of the cost that would have been involved had the work been done under contract.

Just west of Adams, N. J., the committee observed deep-ditch maintenance, consisting of the removal of vegetation and washed-in soil, through use of a Grad-

all machine supplemented by two
The Gradall is a truck-mounted n
essentially of a full-revolving crane
scopic boom with a digging buck
outer end. The boom may be raise
horizontal or lowered 44 deg. bel
telescopic feature, the boom may b
tracted through a range of 12 ft.
tended length being 24 ft.. These f
ing the bucket 14 ft. 9 in. above
the truck wheels are resting, or lo
low the grade. Also, the boom may
about its longitudinal axis, the arc
deg. each side of the vertical.[1]

The amount of ditch cleaned pe
chine ranges from 500 to 700 ft.

[1]A detailed description of the Gradall and
York division of the Pennsylvania appeared ir
Engineering and Maintenance.



Above (left)—One of the first stops was to witness deep ditching and ditch-cleaning operations, u
New York division. (Right)—During the 1948 working season, the committee was told, the Pennsylvan
400 mi. of track with gangs similar to this one, employing 24 pneumatic tamping tools and large-cap

"WE'LL GET THE 3,000— YOU GET THE ONE"

Every once in a while someone comes up with a good slogan which not only arrests attention, but, by design or accident, contains a fact so fundamental that it cannot be ignored. In a membership campaign letter just sent out by the Locomotive Maintenance Officers' Association a closing sentence calls attention to the fact that the membership goal of the association is 3,001, and the phrase was added "We'll get the 3,000—you get the 1." It reminds us that it was only 11 years ago that this group of mechanical maintenance officers and supervisors started this association with a numerical strength of less than a hundred men, all of whom were farsighted and enthusiastic enough to realize the importance of locomotive maintenance in the railroad industry. Since that time the membership of this group has grown until it has crowded the 2,000 mark at the peak of registrations. This has been done, not by any mass effort on the part of any large group, but by the individual efforts of the fellow who got the one member at a time and then sent this recruit out to bring in another one.

In this manner there has been built up a group of associations, such as the Air Brake, Car Department Officers', Master Boiler Makers', Locomotive Maintenance Officers', and Railway Fuel and Traveling Engineers' which will hold their technical meetings at Chicago during the week of September 19. In connection with these meetings the Allied Railway Supply Association will hold its exhibit. At the technical meetings the cumulative work of more than two dozen committees in the five associations will be crystallized in reports containing information dealing with maintenance practices on steam and Diesel locomotives, passenger and freight cars, and in shops and engine terminals. These reports in most instances not only describe, but recommend, practices that are the means of saving hundreds of thousands of dollars in maintenance and servicing expense.

This year, particularly, with the advent of the 40-hr. week and its increase in the expense of all phases of railroad operation, the work of all railroad associations such as these is of unusual importance; there is no more effective manner of obtaining the information that railroads need to help them in reducing expenses than by having representatives at the meetings.

The General Committee of the Mechanical Division of the Association of American Railroads has suggested the desirability of a widespread representation at these meetings and it is hoped that the inclination to economize this year will not take the form of withholding the approval for mechanical-department supervisors to attend them. If there was ever a year in which really substantial returns on an investment in sending men to technical meetings such as these are to be realized, this is the year.

THE YARD-DESIGN PROBLEM

Probably no single phase of railway engineering is getting more attention at the moment than the design of freight classification yards. The railroads have found that yard improvement projects are exceedingly attractive business investments; they not only make possible better service to shippers, but the savings realized through reduced operating costs are usually such as to afford a handsome return on the expenditure.

Yard design is not, however, a problem to be solved merely by solving mathematical equations. There are usually so many variables present that the designer must depend largely on empirical methods, personal judgment and observation of different types of yards in service on his own and other roads. And, even with much care, he can seldom be quite certain that he has developed the best possible design—the one that will bring the largest savings and greatest improvement in service per dollar of money invested.

This situation has resulted in some interesting anomalies. For instance, while the general trend seems to be toward hump-retarder yards, several roads have recently converted manually-operated hump yards into flat or "saucer" type yards. Again, while the general impression prevails that the number of cars to be handled must be extremely large to justify a hump-retarder yard, one road is making plans to build such a yard at a location where only a moderate amount of traffic is handled.

Even where local conditions appear to be essentially similar there is frequently broad divergence in the solutions adopted. This is reflected in the ease with which engineers or operating officers from one road can locate what they consider to be "bugs" in new yards on other lines. In fact, analyzing newly constructed yards on other roads has developed into quite a sport these days.

Perhaps there will be some clarification of the atmosphere when the Yards and Terminals committee of the American Railway Engineering Association begins to issue reports on its assignment to investigate the "relative advantages and physical factors to be considered in the design and selection of flat, gravity or hump yards for handling various volumes and kinds of traffic." In this assignment the committee has a big wad to chew. If it is able to establish definite principles applicable to various conditions, an important and timely contribution to the science of railway engineering will have been made.

Mechar

The following report might be termed the unofficial "minutes" of a two-day inspection trip of the Committee on Economics of Railway Labor, American Railway Engineering Association, over portions of the Pennsylvania Railroad by bus and train, July 12-13. It is necessarily a highly-condensed running report of the trip, omitting hundreds of general observations of standards, methods and organizations, and referring only briefly to the more important features that are of immediate interest to the committee in its current study of mechanized operations to effect economies in track maintenance work. Accompanying the report are a few of the more than 75 photographs taken by the author, showing the "committee at work" and the machine operations observed.

July 12 and 13 witnessed activities, events and collaboration between railway engineering and maintenance officers of a character that augurs well for the fixed properties of the railroads and their efficient and economical maintenance. Representing more than 30 roads, the Committee on Economics of Railway Labor, of the American Railway Engineering Association has just completed a 400-mi. inspection trip over some of the main lines of the Pennsylvania—by chartered bus and special train—from New Brunswick, N. J., via Philadelphia, Pa., to Pittsburgh. Eyes are still bulging, notebooks are full, film records have been made—we have seen in action much of the Pennsylvania's mechanized methods of roadway and track maintenance, and have learned much therefrom.

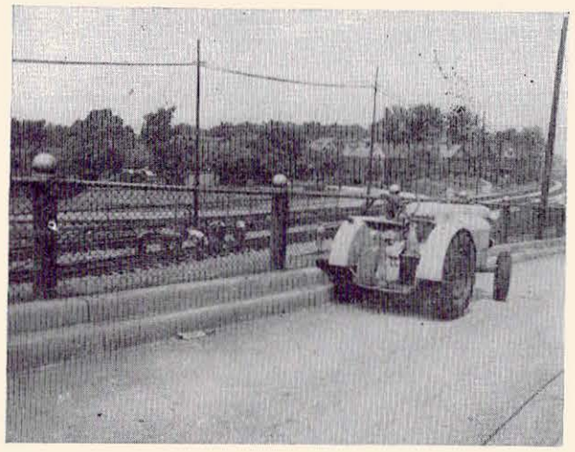
Under its assignment, "Analysis of Operations of Railways That Have Substantially Reduced the Cost of Labor Required in Maintenance-of-Way Work," the committee this year decided to study the economics of mechanized maintenance-of-way met
instinctively turned its attention to
which, for many years, through i
progressive management and top-r
and maintenance of-way officers, ha
for its interest in the development
variety of power tools and machines
way work, looking to improved st
greater efficiency, and lower unit c
The suggestion of the committee's
Pennsylvania methods was enough
prompt and wholehearted welcome—
implemented by transportation arra
ties that enabled the committee conv
mechanized operations in a minimu

Despite the efficient arrangemen
tion time permitted the observatio
segment of the Pennsylvania's vast
nance operations. But the groundwo
sequent detailed studies and analy
gang organizations, and of producti
that are certain to contribute mat
of all roads to raise maintenance s
maintenance costs.

Deep Ditching on N. Y. Divisi

At 8:30 a.m., July 12, two busl
engineering and maintenance office
engineers and engineers maintena
from New Brunswick station to se
on the electrified four- to six-tra
New York division. On this leg of t
was driven 59 mi. to Philadelphia,
of-way, under the direction of Cor

Above (left)—Chartered buses gave the committee an opportunity to see mechanized maintenance oper division—largely via the right-of-way. (Right)—One of the Pennsylvania's inspection cars, with its s end, gave the committee an unobstructed view of the railroad from Philadelphia to Pittsburgh



Tractor-mounted compressors, such as the one illustrated, are being used by many section and small extra gangs on the Pennsylvania for spot, intermediate or follow-up tamping—as well as for other purposes

amount of material to be removed. The average cost of cleaning ditches per foot is 12 cents, including depreciation, interest on investment, wages, fuel, lubricants, etc.

Big-Scale Pneumatic Tamping

At Deans, N. J., the committee's buses again turned into a right-of-way truck road, many miles of which have been provided on the Pennsylvania to permit the use of off-track equipment and trucks in maintenance operations. We drove along the track for several thousand feet to witness out-of-face tie tamping operations utilizing 24 pneumatic tamping tools and a 315-cu. ft. capacity crawler compressor. These outfits, of which the Pennsylvania has a considerable number, each represent an investment of approximately $13,000. They are capable of tamping an average of 150 to 180 lin. ft. of track per working hour. During 1948, the committee was told, the Pennsylvania tamped approximately 400 mi. of track with units identical or similar to the one observed. Experience has shown that tamping performed by this method can be expected to last twice as long as that done by hand tamping with picks, and results in an immediate saving of approximately 10 per cent in man-hours.

Further along the line the committee was shown how the Pennsylvania is equipping many of its main-line section gangs with portable air compressors for spot, intermediate or follow-up tamping. The use of this equipment, it was said, results in more uniform tamping, of a quality comparable to that being produced by the road's large out-of-face pneumatic outfits.

Some of the compressors furnished to section gangs are 60-cu. ft. capacity, but the majority are 105-cu. ft. machines. Some are mounted on two-wheel pneumatic-tired chassis, equipped with hitches for towing from one location to another. Others are an integral part of a pneumatic-tired, farm-type tractor.

The tractor-mounted compressors are multiple-purpose machines. They are proving a valuable asset in the possession of section gangs. In addition to tie tamping, these units can be used for operating spike drivers and other pneumatic tools. They are valuable labor savers when equipped with a trailer for hauling men, tools and material; with broom or plow for snow removal; with sickle bar for mowing right-of-way; and with front-end loader for collecting materials from ground to railroad cars or trucks.

Ballast Cleaning under Heavy Traffic

At another point on the New York division an opportunity was afforded to see a McWilliams ballast cleaning mole at work—one of a large number of such machines used on the Pennsylvania. Their most valuable assignment is the cleaning of intertrack or border ballast at locations where density of traffic or physical characteristics of the railroad will not permit the economical use of larger ballast cleaning devices, such as the Brownhoist and Speno machines currently used on other parts of the road.

During 1948 508 mi. of intertrack and border ballast were cleaned on the Pennsylvania with moles, at a cost averaging 17.3 cents per foot, depending on the territory in which they were utilized. It was estimated that by the use of each such machine, working two 8-hr. tricks per day, approximately 14,400 fewer man-hours

One of the Pennsylvania's four Industrial-Brownhoist ballast cleaners, each of which, it was said, will clean from 1400 to 1600 lin. ft. of intertrack per working hour, at an average cost of 7 cents a foot

are required than when performing the same amount of cleaning by means of hand tools.

Between Philadelphia and Pittsburgh

Much impressed with "samples" of mechanized maintenance on the heavily trafficked New York line carrying, as it does, roughly 400 scheduled passenger trains and an average of 45 freights daily—the former traveling as fast as 75 m.p.h.—the cavalcade took a highway short-cut into Philadelphia. Forty-five minutes after rolling up in front of the Bellevue Stratford Hotel—coats off, sleeves up, and papers spread out over a 40-ft. table—the committee was in session—with a seven-subject agenda before it. After an interlude for dinner, it was back at work again at 7:30 p.m. for another two-hour session, at which it voted unanimously to undertake a study of ways and means of increasing the efficiency of the maintenance forces and of holding down

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maintenance costs under the shorter work week effective September 1.

At 6:45 a.m. the following morning, the committee was again on its way, moving out of Broad Street station by train, destined for Pittsburgh, 348 mi. away. A feature of the train, which included only four cars, was one of the inspection cars of the Pennsylvania, coupled to the rear end, which provides an observation platform, about 35 ft. long, equipped with upholstered seats, ramped upward on each side of a center aisle, to accommodate 36 persons. With additional folding chairs in the aisle between fixed seats, the observation end comfortably accommodates 42 persons.

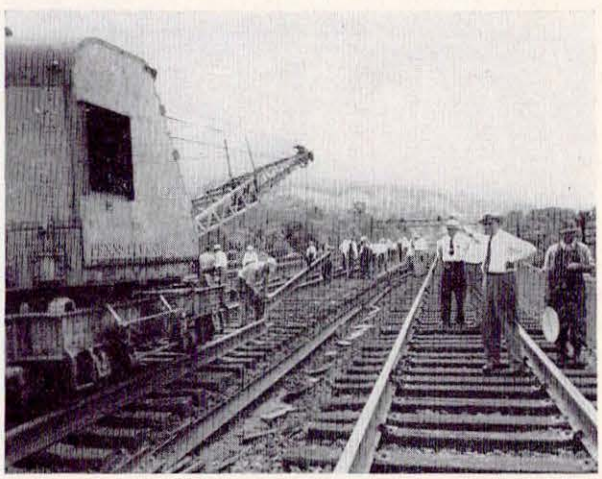
Recently shopped and painted, the inspection car, with full-open rear and stepped windows along both sides of the observation end, afforded ideal accommodations for the purpose at hand, with an unobstructed view of the track for everyone. The stage was set to see every mile of the four-track main line to Pittsburgh, plus specific features of construction, maintenance and equipment operation en route.

More Deep Ditching and Cut Widening

Passing through the road's Thirtieth Street station and West Philadelphia, we were soon speeding westward over the four-track, electrified main line to Harrisburg—all 155-lb. rail territory, and typical of the highest standards of track construction and maintenance on the entire railroad. Shortly we were to see numerous examples of deep ditching and cut widening undertaken in recent years to dry out and stabilize the track. Typical of this class of work was Murphy's cut, just east of Parkesburg, Pa., where the cut face had been moved back from the tracks, the ditch deepened, and the side slope veneered with from three to six inches of engine cinders to retard erosion. A berm ditch was also provided along the top of the cut slope to intercept and carry away water that would otherwise flow down the cut face.

Prior to being moved back, the toe of the cut slope at this point was approximately eight to nine feet from the nearest rail and the drainage ditch was approximately one foot below the bottom of the stone ballast section. Improving the drainage conditions here was done under contract, about five years ago, and the committee was told that the annual savings in track-maintenance labor costs in this area, resulting from the improved drainage conditions, equal approximately one-sixth the cost of carrying out the work.

Witnessing the battery of machines in one of the Pennsylvania's four mechanized rail-train organizations was one of the highlights of the trip



Later in the morning we were to see again how the Pennsylvania, with its own equipment, is constantly improving drainage conditions along its tracks, using crawler tractors equipped with angledozer and winch, to grade the right-of-way to carry surface water away from the roadbed. The Pennsylvania has 36 such heavy grading units, which are used in this type of work when they are not required for grading in connection with track construction or relocation.

At Harrisburg, during a pause of about 45 min., the committee was given an "extra," in a quick inspection of the Pennsylvania's new $3,500,000 Diesel locomotive servicing and repair shop at that point.[2] We then entered the Middle division of the Eastern region, and one of the most interesting of the next few inspection stops was one made to witness large scale ballast cleaning operations west of Marysville, Pa. employing one of the Pennsylvania's four Industrial Brownhoist ballast cleaners.

This machine employs a series of digging buckets, 26 in. wide, at the front end, which remove the fouled ballast in the track shoulder or center ditch to a depth of 10 in. below the bottoms of the ties. All of the removed material is elevated to vibrating screens, where the dirt, cinders and other fouling material is screened out, the clean stone being conveyed back to the track, while the screening move over a series of belt conveyors to any one of 9 bottom-dump 70-ton hopper cars coupled to and moving behind the cleaner.

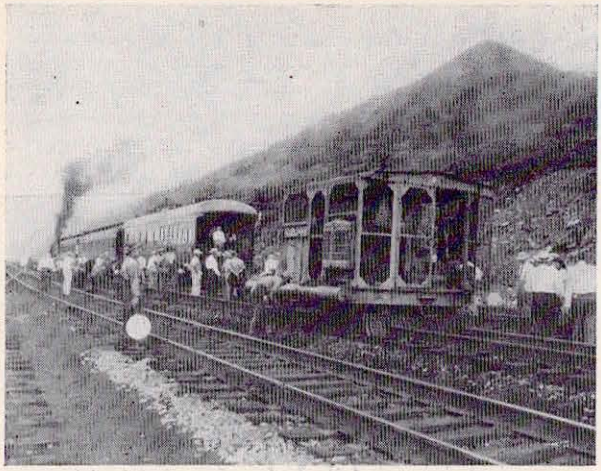
Each of these machines and its associated equipment represents an investment of approximately $450,000. They are capable of cleaning 1,400 to 1,600 lin. ft. of intertrack space per working hour at an average cost of 7 cents a foot, depending upon the amount of ballast between or along the tracks, traffic conditions and physical characteristics of the territory. Last year three of these machines were worked on a three eight-hour-trick basis; together with two somewhat similar machines rented from the Frank Speno Ballast Cleaning Company, working 8 hrs. per day, they cleaned 2,808 mi. of intertrack and border ballast.

Mechanized Rail Laying

A few miles west on the Middle division the committee had an opportunity, in a 20-min. stop, to see a 115-man gang in one of the specialties of the Pennsylvania—fully mechanized rail laying. Here, replacing 152-lb. rail with rail of 155-lb. section, was one of the road's four rail-train organizations, employing mechanized methods at their best, with many well-known and accepted power tools and machines, plus a few recently developed further to improve operations, promote safety among the forces, and reduce cost.[3] Among the newer units is a so-called "Extruder," which lowers evenly the ballast in the tie cribs ahead of the

[2] A complete description of this shop appeared in *Railway Age* of January 15, 1949.

[3] A detailed description of the newer features of mechanized rail laying on the Pennsylvania will appear in the September issue of *Railway Engineering and Maintenance*.

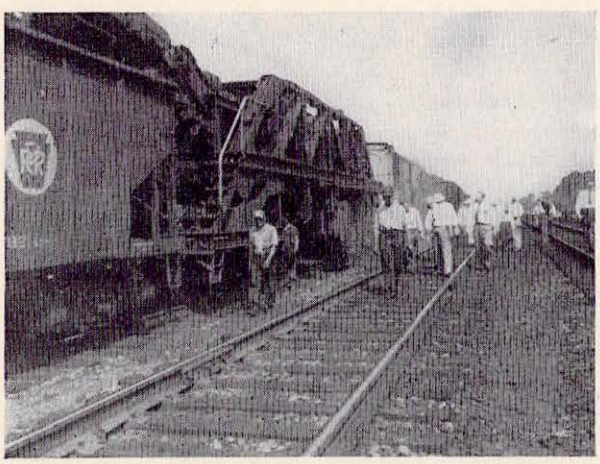


Large-scale track raising and surfacing—employing a Nordberg power track jack and Pullman-Standard power ballaster—were observed west of Johnstown, Pa.

adzers; a "Greaser" for heating and spraying a rust inhibiting and lubricating grease on to the new rail ends, joint bars and bolts; and an electronic loudspeaker which, in the hands of a watchman, warns the workmen over a range of one-half mile of the approach of trains.

Near Altoona, 234 mi. from Philadelphia, there was a slow-down to see the Pennsylvania's portable laboratory designed primarily for determining web stresses in rail under traffic. Here it was at work, directly alongside the tracks—a typical highway house-type trailer, equipped with oscillograph, amplifiers, portable generator, strain gages, tables, darkroom, etc., to permit 12 simultaneous strain measurements at one time.

Leaving Altoona, about 1 p.m., the division point between the Eastern and Central regions of the Pennsylvaia, our train began almost immediately its winding trip through the Alleghenies, including a swing around the famous Horseshoe Curve, with its four tracks, 1.75 per cent grade, and maximum curvature of 9 deg. 30 min. Here, the committee was told that the 140-lb. rail on the eastward freight track has to be



The big Diesel sweeper seen on the Pittsburgh division was an eye-opener to many on the committee. In 1948 this machine cleaned 745 mi. of track, loading 750 hopper cars of dirt

transposed approximately every six months and renewed every year.

Prior to reaching this curve, a large capacity, company owned wheeled scraper was seen along the track cleaning a ditch. On the inside of another sharp curve, attention was called to a 700-ft. trestle, constructed at a cost of about $16,000, for the purpose of economically unloading and disposing of the dirt loaded into hopper cars by the ballast-cleaning machine visited earlier. Dirt unloaded from this trestle (ultimately for the purpose of widening and strengthening the roadbed and reducing curvature) is constantly leveled and rolled by means of a tractor bulldozer. It was estimated that the capacity of this dump is upwards of 400,000 cu. yd., and that to date approximately 195,000 cu. yd. have been unloaded into it at a cost of 13 cents a yard.

While still on the east slope of the mountains, we were shown another dumping operation, this time in connection with an important line change, employing a 15-ton crawler crane with a 1½-cu. yd. clamshell bucket. At this location, cut excavation, "industrial" waste material, and dirt loaded into gondolas in ditch-cleaning operations on the Pittsburgh division (Altoona to Pittsburgh) are being unloaded at the rate of 10 to 12 cars a day, at a cost of approximately 27 cents a yard.

Power Tamping and Track Sweeping

Passing over the summit of the Alleghenies at Gallitzin, 11.8 mi. from Altoona, we began the descent of the west slope—a maximum grade of 1.18 per cent—which extends almost into Johnstown, Pa., a distance of 26 mi. At South Fork, another stop was made to witness track raising and surfacing work, employing a Nordberg power track jack and a Pullman Standard power ballaster. To take advantage of the track being out of service, the surfacing gang was followed immediately by a Railway Track-Work cross grinder slotting the rail ends, and by a Nordberg power wrench adjusting the tension in all joint bolts—the entire organization moving forward at a rate of about one-half mile of track per day.

The culminating stop of the trip was one made near Greensburg, Pa., to witness the operation of the road's Diesel-powered track sweeper; the result of years of experimenting to develop the most effective means of cleaning track of front-end sparks, sand, etc.[4] During the 1948 working season, operating two eight hour tricks each day, this machine swept 745 mi. of track; and loaded 750 hopper cars of dirt. In further solution of the Pennsylvania's track cleaning problem, especially on its mountain grades and in yards, is the acquisition of a duplicate of the Diesel sweeper which is now under construction at an estimated cost of $380,000.

Arriving at Pittsburgh the enlightening, instructive and, withal, enjoyable two-day inspection trip was at an end. The Pennsylvania, through the facilities afforded, had rendered great service to the Committee on Economics of Railway Labor, to each of the individual roads represented therein, to the A.R.E.A., and, in fact, to the entire railroad industry, in its effort to improve standards of service while holding maintenance costs to the minimum.

[4] A description of this machine appeared in the June, 1949, issue of *Railway Engineering and Maintenance*.

"WE'LL GET THE 3,000— YOU GET THE ONE"

Every once in a while someone comes up with a good slogan which not only arrests attention, but, by design or accident, contains a fact so fundamental that it cannot be ignored. In a membership campaign letter just sent out by the Locomotive Maintenance Officers' Association a closing sentence calls attention to the fact that the membership goal of the association is 3,001, and the phrase was added "We'll get the 3,000—you get the 1." It reminds us that it was only 11 years ago that this group of mechanical maintenance officers and supervisors started this association with a numerical strength of less than a hundred men, all of whom were farsighted and enthusiastic enough to realize the importance of locomotive maintenance in the railroad industry. Since that time the membership of this group has grown until it has crowded the 2,000 mark at the peak of registrations. This has been done, not by any mass effort on the part of any large group, but by the individual efforts of the fellow who got the one member at a time and then sent this recruit out to bring in another one.

In this manner there has been built up a group of associations, such as the Air Brake, Car Department Officers', Master Boiler Makers', Locomotive Maintenance Officers', and Railway Fuel and Traveling Engineers' which will hold their technical meetings at Chicago during the week of September 19. In connection with these meetings the Allied Railway Supply Association will hold its exhibit. At the technical meetings the cumulative work of more than two dozen committees in the five associations will be crystallized in reports containing information dealing with maintenance practices on steam and Diesel locomotives, passenger and freight cars, and in shops and engine terminals. These reports in most instances not only describe, but recommend, practices that are the means of saving hundreds of thousands of dollars in maintenance and servicing expense.

This year, particularly, with the advent of the 40-hr. week and its increase in the expense of all phases of railroad operation, the work of all railroad associations such as these is of unusual importance; there is no more effective manner of obtaining the information that railroads need to help them in reducing expenses than by having representatives at the meetings.

The General Committee of the Mechanical Division of the Association of American Railroads has suggested the desirability of a widespread representation at these meetings and it is hoped that the inclination to economize this year will not take the form of withholding the approval for mechanical-department supervisors to attend them. If there was ever a year in which really substantial returns on an investment in sending men to technical meetings such as these are to be realized, this is the year.

THE YARD-DESIGN PROBLEM

Probably no single phase of railway engineering is getting more attention at the moment than the design of freight classification yards. The railroads have found that yard improvement projects are exceedingly attractive business investments; they not only make possible better service to shippers, but the savings realized through reduced operating costs are usually such as to afford a handsome return on the expenditure.

Yard design is not, however, a problem to be solved merely by solving mathematical equations. There are usually so many variables present that the designer must depend largely on empirical methods, personal judgment and observation of different types of yards in service on his own and other roads. And, even with much care, he can seldom be quite certain that he has developed the best possible design—the one that will bring the largest savings and greatest improvement in service per dollar of money invested.

This situation has resulted in some interesting anomalies. For instance, while the general trend seems to be toward hump-retarder yards, several roads have recently converted manually-operated hump yards into flat or "saucer" type yards. Again, while the general impression prevails that the number of cars to be handled must be extremely large to justify a hump-retarder yard, one road is making plans to build such a yard at a location where only a moderate amount of traffic is handled.

Even where local conditions appear to be essentially similar there is frequently broad divergence in the solutions adopted. This is reflected in the ease with which engineers or operating officers from one road can locate what they consider to be "bugs" in new yards on other lines. In fact, analyzing newly constructed yards on other roads has developed into quite a sport these days.

Perhaps there will be some clarification of the atmosphere when the Yards and Terminals committee of the American Railway Engineering Association begins to issue reports on its assignment to investigate the "relative advantages and physical factors to be considered in the design and selection of flat, gravity or hump yards for handling various volumes and kinds of traffic." In this assignment the committee has a big wad to chew. If it is able to establish definite principles applicable to various conditions, an important and timely contribution to the science of railway engineering will have been made.

The following report might be termed the unofficial "minutes" of a two-day inspection trip of the Committee on Economics of Railway Labor, American Railway Engineering Association, over portions of the Pennsylvania Railroad by bus and train, July 12-13. It is necessarily a highly-condensed running report of the trip, omitting hundreds of general observations of standards, methods and organizations, and referring only briefly to the more important features that are of immediate interest to the committee in its current study of mechanized operations to effect economies in track maintenance work. Accompanying the report are a few of the more than 75 photographs taken by the author, showing the "committee at work" and the machine operations observed.

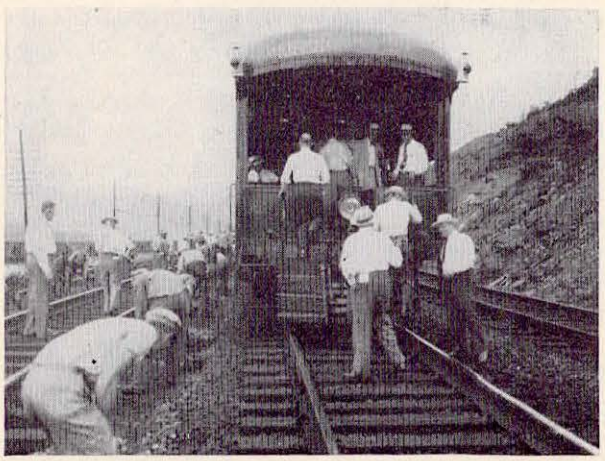
July 12 and 13 witnessed activities, events and collaboration between railway engineering and maintenance officers of a character that augurs well for the fixed properties of the railroads and their efficient and economical maintenance. Representing more than 30 roads, the Committee on Economics of Railway Labor, of the American Railway Engineering Association has just completed a 400-mi. inspection trip over some of the main lines of the Pennsylvania—by chartered bus and special train—from New Brunswick, N. J., via Philadelphia, Pa., to Pittsburgh. Eyes are still bulging, notebooks are full, film records have been made—we have seen in action much of the Pennsylvania's mechanized methods of roadway and track maintenance, and have learned much therefrom.

Under its assignment, "Analysis of Operations of Railways That Have Substantially Reduced the Cost of Labor Required in Maintenance-of-Way Work," the committee this year decided to study the economics of mechanized maintenance-of-way methods. This done, it instinctively turned its attention to the Pennsylvania, which, for many years, through its forward-looking, progressive management and top-ranking engineering and maintenance of way officers, has been outstanding for its interest in the development and use of a wide variety of power tools and machines in maintenance-of-way work, looking to improved standards, constantly greater efficiency, and lower unit costs for such work. The suggestion of the committee's interest in studying Pennsylvania methods was enough to bring forth a prompt and wholehearted welcome—a welcome that was implemented by transportation arrangements and facilities that enabled the committee conveniently to see many mechanized operations in a minimum of time.

Despite the efficient arrangements, two days inspection time permitted the observation of only a limited segment of the Pennsylvania's vast mechanized maintenance operations. But the groundwork was laid for subsequent detailed studies and analyses of methods and gang organizations, and of production records and costs, that are certain to contribute materially to the efforts of all roads to raise maintenance standards and reduce maintenance costs.

Deep Ditching on N. Y. Division

At 8:30 a.m., July 12, two busloads of top railroad engineering and maintenance officers, including 17 chief engineers and engineers maintenance of way, started from New Brunswick station to see selected operations on the electrified four- to six-track densely trafficked New York division. On this leg of the journey the group was driven 59 mi. to Philadelphia, largely via the right-of-way, under the direction of Committee Chairman H.



Above (left)—Chartered buses gave the committee an opportunity to see mechanized maintenance operations on the New York division—largely via the right-of-way. (Right)—One of the Pennsylvania's inspection cars, with its spacious, open observation end, gave the committee an unobstructed view of the railroad from Philadelphia to Pittsburgh

Maintenance — Pennsylvania Style

Road affords Committee on Economics of Railway Labor, A.R.E.A., a panorama, via train and bus from New Brunswick, N. J., to Pittsburgh, Pa., of its highly-organized machine methods

By NEAL D. HOWARD,
Western Editor
Railway Age

E. Kirby, cost engineer of the Chesapeake & Ohio. J. L. Gressitt, chief engineer of the P. R. R., and S. R. Hursh, assistant chief engineer-maintenance, P. R. R.

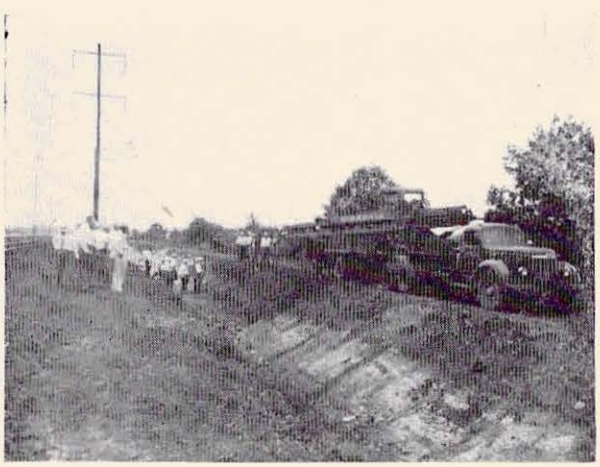
The party first made two stops to examine sections of the deep ditching, many miles of which adjoin the wide roadbed of the New York division, for the purpose of lowering the high watertable in this area and adding stability to the track substructure.

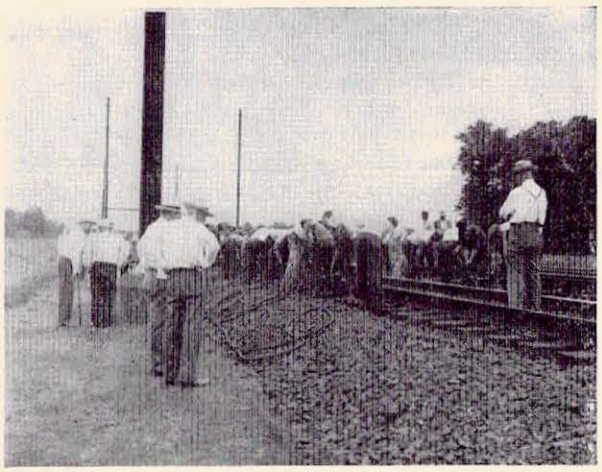
At Howes Lane, N. J., work was about half completed on a project to provide a mile-long ditch, 7 to 9 ft. deep, far enough from the rails to provide a 20-ft. track shoulder. To complete this work, which will involve the moving of approximately 25,000 cu. yd. of earth and shale, the road—with company forces and equipment—is using a ¾-yd. dragline bucket and crane; a 100-hp. crawler tractor equipped with angle-dozer and winch; a Gradall ditching machine; several 5-ton capacity dump trucks, and a 160-cu. ft. air compressor to operate demolition tools. Previous experience with such ditches assure that this one will accomplish the drainage desired, and the committee was told that this particular job will not exceed 75 to 80 per cent of the cost that would have been involved had the work been done under contract.

Just west of Adams, N. J., the committee observed deep-ditch maintenance, consisting of the removal of vegetation and washed-in soil, through use of a Gradall machine supplemented by two 5-ton dump trucks. The Gradall is a truck-mounted machine, consisting essentially of a full-revolving crane supporting a telescopic boom with a digging bucket attached at its outer end. The boom may be raised 22 deg. above the horizontal or lowered 44 deg. below it. Through its telescopic feature, the boom may be extended or contracted through a range of 12 ft., the maximum extended length being 24 ft.. These features permit raising the bucket 14 ft. 9 in. above the grade on which the truck wheels are resting, or lowering it 10 ft. below the grade. Also, the boom may be rotated or tilted about its longitudinal axis, the arc of rotation being 45 deg. each side of the vertical.[1]

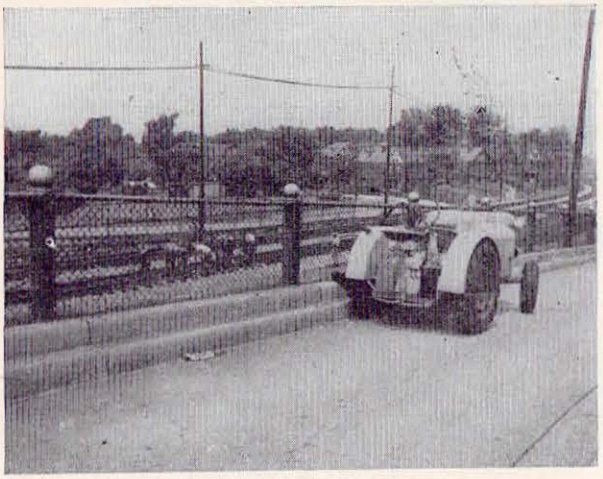
The amount of ditch cleaned per day with this machine ranges from 500 to 700 ft., depending on the

[1] A detailed description of the Gradall and its operations on the New York division of the Pennsylvania appeared in the July issue of *Railway Engineering and Maintenance*.





Above (left)—One of the first stops was to witness deep ditching and ditch-cleaning operations, using a Gradall, on the New York division. (Right)—During the 1948 working season, the committee was told, the Pennsylvania tamped approximately 400 mi. of track with gangs similar to this one, employing 24 pneumatic tamping tools and large-capacity crawler compressors



Tractor-mounted compressors, such as the one illustrated, are being used by many section and small extra gangs on the Pennsylvania for spot, intermediate or follow-up tamping—as well as for other purposes

amount of material to be removed. The average cost of cleaning ditches per foot is 12 cents, including depreciation, interest on investment, wages, fuel, lubricants, etc.

Big-Scale Pneumatic Tamping

At Deans, N. J., the committee's buses again turned into a right-of-way truck road, many miles of which have been provided on the Pennsylvania to permit the use of off-track equipment and trucks in maintenance operations. We drove along the track for several thousand feet to witness out-of-face tie tamping operations utilizing 24 pneumatic tamping tools and a 315-cu. ft. capacity crawler compressor. These outfits, of which the Pennsylvania has a considerable number, each represent an investment of approximately $13,000. They are capable of tamping an average of 150 to 180 lin. ft. of track per working hour. During 1948, the committee was told, the Pennsylvania tamped approximately 400 mi. of track with units identical or similar to the one observed. Experience has shown that tamping performed by this method can be expected to last twice as long as that done by hand tamping with picks, and results in an immediate saving of approximately 10 per cent in man-hours.

Further along the line the committee was shown how the Pennsylvania is equipping many of its main-line section gangs with portable air compressors for spot, intermediate or follow-up tamping. The use of this equipment, it was said, results in more uniform tamping, of a quality comparable to that being produced by the road's large out-of-face pneumatic outfits.

Some of the compressors furnished to section gangs are 60-cu. ft. capacity, but the majority are 105-cu. ft. machines. Some are mounted on two-wheel pneumatic-tired chassis, equipped with hitches for towing from one location to another. Others are an integral part of a pneumatic-tired, farm-type tractor.

The tractor-mounted compressors are multiple-purpose machines. They are proving a valuable asset in the possession of section gangs. In addition to tie tamping, these units can be used for operating spike drivers and other pneumatic tools. They are valuable labor savers when equipped with a trailer for hauling men, tools and material; with broom or plow for snow removal; with sickle bar for mowing right-of-way; and with front-end loader for collecting materials from ground to railroad cars or trucks.

Ballast Cleaning under Heavy Traffic

At another point on the New York division an opportunity was afforded to see a McWilliams ballast cleaning mole at work—one of a large number of such machines used on the Pennsylvania. Their most valuable assignment is the cleaning of intertrack or border ballast at locations where density of traffic or physical characteristics of the railroad will not permit the economical use of larger ballast cleaning devices, such as the Brownhoist and Speno machines currently used on other parts of the road.

During 1948 508 mi. of intertrack and border ballast were cleaned on the Pennsylvania with moles, at a cost averaging 17.3 cents per foot, depending on the territory in which they were utilized. It was estimated that by the use of each such machine, working two 8-hr. tricks per day, approximately 14,400 fewer man-hours

One of the Pennsylvania's four Industrial-Brownhoist ballast cleaners, each of which, it was said, will clean from 1400 to 1600 lin. ft. of intertrack per working hour, at an average cost of 7 cents a foot

are required than when performing the same amount of cleaning by means of hand tools.

Between Philadelphia and Pittsburgh

Much impressed with "samples" of mechanized maintenance on the heavily trafficked New York line carrying, as it does, roughly 400 scheduled passenger trains and an average of 45 freights daily—the former traveling as fast as 75 m.p.h.—the cavalcade took a highway short-cut into Philadelphia. Forty-five minutes after rolling up in front of the Bellevue Stratford Hotel—coats off, sleeves up, and papers spread out over a 40-ft. table—the committee was in session—with a seven-subject agenda before it. After an interlude for dinner, it was back at work again at 7:30 p.m. for another two-hour session, at which it voted unanimously to undertake a study of ways and means of increasing the efficiency of the maintenance forces and of holding down

Improving the Ride in Passenger Trains

A non-technical review of recent refinements in passenger-car trucks which have effected improvements in smoothness of operation at high speeds

By **KENNETH CARTWRIGHT**
Chief Mechanical Engineer,
New York, New Haven & Hartford

In the last 10 years, as passenger-car speeds have been increased, the effect of truck design on the riding qualities of passenger-train cars has become one of the most important engineering problems confronting the railroads and car builders. In the early days, a truck with a long wheel base was favored and opinion was divided as to a choice between a four-wheel and a six-wheel truck. One of the main reasons for the preference for a truck with a long wheel base was that, with a given wheel taper, it reduced the frequency of the nosing movement.

Wheel Base and Tread Contour

The tendency of the truck to nose is involved with a question of wheel contour. There has never been any general agreement as to the most desirable wheel contour, whether it should be a cylindrical tread or tapered and if tapered, the amount of taper. The present Association of American Railroads standard wheel contour is a straight taper of 1 in 20. If a pair of wheels having a tread of this taper is mounted solidly on an axle and allowed to roll freely on straight track without any restraint, the path will be a sine curve. This, of course, causes the axle to weave back and forth through a slight angle. This weaving or hunting tendency can, under certain conditions, cause a nosing motion to be set up in the truck, the frequency of which will be reduced by spreading the axles farther apart.

Attempts to reduce this nosing tendency led to experiments about 15 years ago with wheels having cylindrical treads. The Chicago North Shore & Milwaukee found a marked improvement at high speeds with motor cars having cylindrical treads on the wheels. Similar results were found by some other railroads, while others found no improvement with cylindrical treads. Reasons for this difference in the results can readily be seen by considering the unrestrained movement of a pair of coned wheels on straight track just previously mentioned. If the wheels and axles in a four-wheel truck are assembled so there is little or no play between the journal boxes and pedestal guides, and a rigid truck frame is used accurately laid out and carefully machined so that the two axles are strictly parallel, there will be little or no tendency for the truck to nose. When the axles are constrained to move parallel with each other they cannot assume any angular position with respect to the longitudinal center line of the track and so the wheels cannot weave back and forth, and the tendency to nosing is eliminated.

This explains why K. F. Nystrom in his experiments on the Milwaukee, using trucks with a rigid cast-steel frame accurately machined to close tolerances, found there was no improvement in riding with wheels having cylindrical treads or with a truck having an 11-ft. wheel base over one with an 8-ft. wheel base. He also found no difference in riding qualities between a six-wheel and four-wheel truck.

For a car such as a diner where there is a marked difference in weight between one end of the car and the other and between one side and the other at the kitchen end, we believe that a six-wheel truck gives better riding. This, we believe, is due to the fact that in a six-wheel truck the center plate is supported at four points, each of which may react independently to rail irregularities. With proper choice of springs, variations in loading may thus be more adequately compensated.

Wheel Balance and Concentricity

The question of unbalanced wheels has been very much in the limelight in the past few months, and recent newspaper articles would lead one to believe that a slightly unbalanced condition in the wheel would cause rough riding at high speeds, and that an absolutely dynamically balanced wheel was the answer to a smooth ride. Unfortunately, these newspaper articles are, as Mark Twain remarked when his death notice appeared in the paper, "a slight exaggeration."

Very elaborate tests have recently been made to determine accurately the effect of unbalanced wheels on riding conditions. The data accumulated in these tests has not yet been completely analyzed, but it can be stated that the amount of unbalance in rolled-steel passenger-car wheels as manufactured has little, if any, effect on the riding quality of the truck. In these tests wheels were used having a deliberately measured unbalance of five pounds. When these wheels were mounted so that the unbalance in one wheel was at 90 deg. with the unbalance in the opposite wheel on the same axle, very little effect on the riding quality of the truck was noticed. It was only when the wheels were mounted so that the unbalance in each wheel was in phase that any appreciable effect on the riding qualities of the truck was noticed. When it is considered that the maximum unbalance in a rolled-steel wheel as manufactured will not be over two to three pounds and the average considerably less, and that the

This article is based on an address before the Railroad Enthusiasts at New York on June 22, 1949.

possibilities of mounting two wheels on the same axle so that the unbalance is exactly in phase is extremely remote, it can be appreciated that the unbalanced wheel is not a serious factor in the riding quality of the truck.

Let me emphasize that I have been considering only the effect on the riding quality. It may be that when all of the data in the test has been analyzed enough improvement in reduction of track and truck stresses will be found to justify the cost of dynamically balancing the wheels. From the standpoint of riding qualities only, however, no such justification can be found.

In these tests incidentally runs were made with different wheel contours and different track gages. The standard A. A. R. wheel contour was used, as well as wheels having a taper of 1 in 40 and wheels having cylindrical treads. It was thought by some that, if the track gage was narrowed so that there would be less clearance between the flange of the wheel and the gage side of the rail, riding would be improved. In order to determine whether or not this was true, sections of tangent track were set up having 4 ft. 8¼ in. gage and 4 ft. 8⅛ in. gage, as compared with the standard 4 ft. 8⅜ in. track gage. While all the data has not yet been thoroughly analyzed, there was not, so far as it was possible to judge by observers riding the car, any marked difference in riding qualities with respect to the three different wheel contours used, or with respect to the three different track gages.

A wheel condition which does have a serious effect on riding qualities is that of wheel concentricity. For good riding at high speeds, the wheel must be concentric with the journal. It has been found that a wheel that is eccentric with the journal by .025 in. to .030 in. will, at high speeds, cause vertical oscillations of the truck frame, which no combination of spring suspension can eliminate before they will be passed on into the car body.

Spring Suspension

Probably the most important basic question with regard to passenger-car truck design is how should the spring suspension be arranged to reduce to a minimum the influences of track unevenness on the motion of the car body. Up until 10 years ago, a combination of coil and elliptic springs was practically universally used. Coil springs were used either over the journal box or between the equalizer and the truck frame with elliptic or semi-elliptic springs used under the bolster. Friction between the leaves of the elliptic springs furnished sufficient dampening to take care of recoil. Trucks of this general design gave reasonably good riding qualities up to speeds of 60 to 70 m.p.h. As speeds were increased above this point, riding qualities deteriorated, and at very high speeds the riding was pretty rough.

In order to improve on the riding qualities of trucks of this general type, there came into use, about 10 years ago, the so-called triple-bolster truck. In this truck no equalizer is used. The truck frame is supported from journal-box housings through large coil springs, two for each journal box. The truck bolster is supported through full elliptic leaf springs carried on long swing hangers. These two hangers, however, are not pivoted on the truck frame as in the conventional truck, but are supported in turn by an intermediate bolster which is hung from the main truck frame through short vertical hangers and coil springs. This type of truck, when well designed, gave extremely good riding qualities.

This idea was carried even further in England and on the Continent where a quadruple suspension was used. This also gives extremely good riding qualities but suffers, as does also the triple bolster truck, from a practical standpoint by reason of the increased weight, first cost and increased maintenance cost due to the multiplicity of parts. With the railroads faced with ever increasing costs, it was natural that stress would be laid upon the development of a truck that would give good riding qualities comparable with those of the triple bolster or quadruple suspension, but which would be lighter, cheaper and simpler and which would require less maintenance.

This resulted in the development of a truck using all coil springs in combination with suitable damping devices. This is commonly called the all-coil soft-spring truck. All other factors being the same, the softer the springs upon which a car body is carried, the more completely and effectively will shocks be cushioned. It is necessary, of course, that sufficient vertical clearance between journal boxes and truck frame be assured to permit free movement at these locations within the range of delivered forces without interference and consequent shock. With the conventional type of truck using coil springs between the equalizer and the truck frame and elliptic springs under the bolster, the total deflection of the combined spring suspension between free height of springs and the working height under light car load will be in the neighborhood of 6 in. By using coil springs for the bolster suspension, the total deflection of the spring suspension from free height to working height under light car load can be increased to 12 in. or slightly over. Thus it can readily be seen that a much smoother ride can be obtained.

However, the greater the spring deflection under any load, the greater will be the car body roll, or inclination of the car body from its normal vertical position when lateral forces are delivered, and on curves with superelevation at high speeds, excessive roll may result. The tendency for the car to roll can be reduced in a conventional all-coil truck by application of anti-roll stabilizers. These, however, have the disadvantage of increasing the number of parts in a truck and consequently increasing the maintenance. When we were investigating the question of truck design for our new postwar passenger equipment on the New Haven, we studied carefully all available data. The goal we set was to develop a truck having (1) easy riding qualities at high speeds; (2) freedom from excessive roll on curves, and (3) good lateral stability, and with the component parts of the truck reduced to the simplest essentials for continued good riding performance and ease of maintenance.

Lateral Stability

After a careful study of the whole problem we came up with the so-called outside-swing-hanger all-coil truck with which all of our post-war passenger cars are equipped. The principal difference in this truck as compared with trucks that have hitherto been in use is in

the location of the swing hangers. These are commonly suspended from the transom on the inside of the truck frame. On our truck we suspend the swing hangers from the outside of the truck frame. This has the effect of increasing the distance between the springs from one side of the truck to the other. It can be shown mathematically that with the same stiffness of spring suspension in #/in. of deflection, the moment resisting car body roll increases faster than the square of the spring base, so that doubling the spring base will provide more than four times the righting moment. We cannot, within our clearance limitations, double the spring base, but by the use of the outside swing hanger, we can increase it so that we get nearly three times the righting moment that we could get with the inside swing hanger arrangement. Thus the tendency of the car body to roll is decreased without going to the added complication of anti-roll stabilizers.

The outside swing hanger is also advantageous in improving the lateral stability. In any design of swing bolster truck the distance apart, length and angularity of the swing hangers has an appreciable effect on the operation. The wider the distance apart, the more stable is the arrangement and the longer are the hangers which can be used. The longer the hangers, the greater is the motion without undue angularity of the hangers. The effect of the angularity of the hangers is quite complicated. If the hangers are straight, the car body will behave like a pendulum whose length is equal to the hangers, and there will be no restraint to the lateral motion of the bolster. In order to increase the lateral restraint the hangers are inclined so that the lower ends are farther apart than the top. This increases the lateral restraint rather quickly. If too large an angle is used the restraint will reach a critical point, depending on dimensions where it becomes excessive and the links are useless. An extreme case would be where the inclination of the hangers is so great that the intersection of their center line is at the height of the center of gravity of the car body. In this case the links are completely ineffective as a cushion against side movement of the truck.

Psychological Factors

Thus it must be concluded that (a) a swing bolster is used to cushion lateral blows due to rough track and short spirals at the ends of curves; (b) long hangers should be used to allow large side motions of the truck to take place with respect to the body; (c) these hangers must be inclined to get the necessary restraint on curves, but the inclination should be as small as is allowable. In the outside swing hanger truck we are able to fulfill these conditions and the length of the swing hanger is increased about 20 per cent over that which can be used with the conventional type of truck, while the angle of inclination of the hanger will be slightly less.

Another advantage in the outside-swing-hanger truck is in the case of inspection and maintenance. With the all-coil inside-hanger truck, it is practically impossible to inspect the condition of the bolster springs or to make any adjustments in the bolster springs without removing the truck from the car or having the car over a pit so that one can get underneath it. With the outside-swing-hanger type of truck these springs are out in the open where inspection is easy and any necessary adjustment can be made quickly and easily.

I recently rode some of our new coaches that had been in service over a year on through service between New York and Washington. The schedules of these trains have just recently been appreciably shortened, and on the Pennsylvania speeds of 90 m.p.h. are regularly attained for long periods. The cars gave what I would call an almost perfect ride, there being no lateral or vertical accelerations noted.

In the reaction of the average passenger to riding qualities, there is a definite psychological factor. If there is any appreciable noise due to brake rigging, buffers or diaphragms the passenger may, and often does, consider that he is getting a rough ride, when measurements of vertical and lateral accelerations of the car body would indicate that a very good ride was being obtained. In recognition of this factor we increased the amount of insulation in our new cars over what was necessary from a heat-insulation standpoint, in order to improve the sound deadening qualities and so quiet the car. Everything possible has been done to eliminate noise and obtain a quiet comfortable ride.

Track and Train Handling

No truck, no matter how well designed and carefully maintained, can give a good ride at high speeds on a poor road bed. Good track is absolutely essential for a good ride at high speeds. The track must be well maintained with respect to both alinement and surface. In this case, when we are talking of surface, we do not necessarily mean the condition as you would see it by sighting along the top of the rail. We mean the surface of the track as it is under load. If there are soft spots in the track, then when the loaded wheel passes over these points, vertical oscillations may be set up, which the spring suspension, even on a well-designed truck, cannot take out before they are transmitted into the car body.

Curvature is of major importance for high-speed operation, even with superelevated curves well spiralled and with the superelevation properly run off on the spiral. It has been found that even a two-deg. curve will give an uncomfortable ride at extremely high speeds.

With the truck and the track in good condition the smoothness of operation then becomes a matter of train handling. There is a considerable difference between American and European practice in the make-up of trains with respect to the coupling of passenger cars. In England and on the Continent the coupler and draft gear are not used as in this country. Spring loaded buffers are applied at the ends of the cars at the end sills and the cars are coupled up by link and chain arrangement with a turnbuckle which compresses the springs in the buffer so that when coupled, the whole train is practically a unit.

This is ideal from the standpoint of elimination of jolting and jarring when starting and stopping the train. Unfortunately, however, if this practice was followed in this country with the weight of our cars and the corresponding weight of one of our trains as compared with English and Continental practice, we have no locomotive which would be capable of starting the

(*Continued on page* 55)

Virginian 6,800-hp. motor-generator locomotive

Motor-Generator Type

The motor-generator type of locomotive permits the application of the d.c. series-wound traction motor, with its highly desirable characteristics, to electrifications deriving their power from a single-phase a.c. trolley. This is of particular benefit in the operation of heavy-drag freight trains on mountain grades.

Nearly thirty years of design and operating experience has gone into the development of this type of locomotive. The latest examples are the units recently placed in service on the electrified sections of the Great Northern and Virginian.

General Characteristics

In heavy-drag freight service, encountered in mountainous territory involving relatively long and heavy gradients, the d.c. series-wound motor has much to recommend its use. In addition to relative simplicity of construction, it has the characteristic ability of producing, without appreciable damage to itself, high initial torques without accompanying armature rotation—a characteristic that finds practical utilization when the motor is used in a locomotive that is required to "lay up" against a heavy train in the effort of getting under way.

The drop in speed and rapid increase in torque of the series motor as its loading is increased, with the accompanying tendency to maintain, to a certain extent, a relatively constant load on the power source, make this motor well suited for traction purposes.

On the other hand, the presence of a commutator on the motor armature restricts the voltage which can be used across the motor to a relatively low value, as transmission and distribution voltages are judged. Hence, the desire to employ a high voltage on the contact system is accompanied by the necessity of using a transforming medium between the contact line and the traction motors, if these are of the d.c. series-wound type. To date the highest practicable contact-line voltage for direct application to the d.c. series-wound motor is something less than 4,000 volts, with the application made by permanently connecting two motor armatures in series and gearing them to a common gear on the driving axle. With something less than 2,000 volts per motor armature, valuable space is required for conductor insulation which might better be used for active material — copper and iron — to secure the maximum output from the restricted spaces in which traction motors are required to work. This is done by the use of the relatively low voltage motors employed in the motor-generator and Diesel-electric types of locomotives.

There is no practically usuable static transformer-rectifier combination commercially available to the locomotive builder that will transform high-voltage a.c. single-phase energy to low-voltage d.c. energy suitable for use with the simple d.c. series-wound motor in traction service. In recent years, the mercury-arc rectifier has been viewed as a possible candidate for this role, but the corrective measures required to minimize primary power-supply wave distortion, characteristic of single-phase rectifier operation, to values acceptable from the viewpoint of communications-lines interference, render this type of transformation unacceptable from the locomotive builder's and operator's point of view.

The a.c. synchronous motor—d.c. generator set in combination with a suitable static transformer of the conventional a.c. type seems to be the most practicable means of energy conversion for locomotive use where series-wound traction motors are employed.

Hence the justification for the motor-generator type of locomotive in heavy traction service.

Advantages

There are several incidental but valuable advantages attendant upon the use of the synchronous motor-generator locomotive:

1. The maintenance of power factor in the railroad-

This is an abstract of a paper presented at the June, 1949, Midyear meeting of the American Society of Mechanical Engineers in San Francisco, Cal.

Great Northern 5,000-hp. motor-generator locomotive

Electric Locomotives Are Good Performers

Capabilities of this type of motive power are shown by operating experience acquired in heavy grade service on the Great Northern and the Virginian

By J. C. FOX
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owned transmission and distribution lines at values close to unity, and in some cases, of leading power factors, is practicable by the control of the synchronous-motor excitation.

2. The motor-generator locomotive is essentially a constant-horsepower machine and, accordingly, the avoidance of large power demands under heavy grade or accelerating conditions is of direct benefit to the operating company's power bills, as influenced by peak-demand charges.

3. The motor-generator set and its control lend themselves to nicety of control functioning during regenerative-braking and motoring periods, with a consequent flexibility and nicety of locomotive and train control.

4. The performance characteristics of the locomotive are independent of contact-system voltage-drop, down to a limit dictated by synchronous-motor pull-out torque.

5. The performance characteristics of this type of locomotive appear to be admirably suited to the operation of railroads traversing long stretches of terrain at river grade, interrupted with severe mountain gradients of appreciable length. Thus, relatively fast schedules are secured for a limited given power demand.

6. Because the motor-generator locomotive is, to a large extent, similar to the Diesel-electric in that both employ driven d.c. generators and associated traction motors, the same design of traction motor can be used in both types of locomotives. Thus, the benefits of standardized production of traction motors are available to the operator of motor-generator locomotives.

In the forepart of 1947, the Great Northern took delivery from the General Electric Company on two, B-D+D-B, 360-ton, 5,000-hp., single-cab locomotives†, bringing the total number of units now operated by this railway to twenty. Table I gives dimensional and other salient characteristics of the electric locomotives in the Great Northern fleet.

†These locomotives were described in *Railway Age* of August 16, 1947

With the delivery in the early part of 1948 of four 6,800-hp., double-cab, 500-ton locomotives, the Virginian became the fourth railroad in the United States to operate this type of motive power. These locomotives, with somewhat more than a million pounds on drivers, classify as the heaviest (so far as driver weight is concerned), and the most powerful continuously rated electric locomotives in service in the United States. Their principal characteristics are shown in Table II.‡

Operation on the Great Northern

Since the Great Northern has been operating motor-generator locomotives in its electrified territory since 1926, the new locomotives initiated in 1947 were not novel in type. As a consequence, the introduction of the new locomotives into service involved primarily an extension of well-established operating methods taking into account the greater ratings and capabilities over the older motive power.

Operation involves gradients of 2.2 per cent and a

‡These locomotives were described in *Railway Age* of April 30, 1949

TABLE I—GREAT NORTHERN 11,000-VOLT, MOTOR-GENERATOR LOCOMOTIVES

Builder—Mechanical	Baldwin	American	General Electric
Builder—Electrical	Westinghouse	General Electric	General Electric
Wheel arrangement	1-D-1	1—C—|—C—1	B—D—|—D—B
Horsepower (Continuous) at rail	1,830	3,000	5,000
Total weight, lb.	371,100*	539,000**	735,000
Weight on drivers, lb.	284,800*	426,200**	735,000
Number of driving axles	4	6	12
Cont. tractive force-lb.	44,250	60,500	119,000
Cont. adhesion—per cent	15.5	14.2	16.2
Speed at Cont. tractive force, m.p.h.	15.5	18.6	15.75
Maximum safe speed, m.p.h.	45	50	65
Length over couplers	47 ft. 2 in.	73 ft. 9 in.	101 ft. 0 in.
Rigid wheel base, maximum	16 ft. 9 in.	15 ft. 4 in.	16 ft. 9 in.
Height overall		15 ft. 3 in.	16 ft. 0 in.
Driving wheel diameter	56 in.	55 in.	42 in.
No. in operation	10	8	2
Year built	1926-28-29	1927-28-30	1947

* The first four locomotives weighed 357,700 lb. with 275,000 lb. on drivers.
**The first two units weighed 518,200 lb. with 410,600 lb. on drivers.

TABLE II—VIRGINIAN MOTOR-GENERATOR LOCOMOTIVES

Builder—Mechanical	General Electric
Builder—Electrical	General Electric
Wheel arrangement	2 (B—B—|—B—B)
Horsepower (continuous) at rail	5,800
Total weight, lb.	1,033,832
Weight on drivers, lb.	1,033,832
Number of driving axles	16
Continuous tractive force, lb.	162,000
Continuous adhesion—per cent	15.8
Speed at cont. tractive force, m.p.h.	15.75
Maximum safe speed, m.p.h.	50
Length over couplers	150 ft. 8 in.
Rigid wheel base, maximum	9 ft. 0 in.
Height overall	16 ft. 3 in.
Driving wheel diameter	42 in.
Number in operation	4
Year built	1948

tunnel approximately eight miles in length, with the line running through mountainous territory subjected to heavy snow falls and a temperature range between −20 and +110 deg. F.

Preliminary tests on the locomotives indicated a freight-train tonnage rating of 2,000 to 2,100 tons as a continuous loading on the 2.2 per cent grades. Scaled-weight trains of these tonnages on the 2.2 per cent grades loaded the locomotive traction motors to continuous rating values, indicating total tractive force of 123,000 lb. at a continuous speed of 15.75 m.p.h. Thus, the rail horsepower delivered at continuous rating developed to be 5,160 hp. Starting tests on these grades developed adhesions of 26.5 per cent and accelerations were accomplished quite readily without the use of sand on clean, dry rail.

With full-rated tonnages, the locomotives are worked at adhesion values approximating 17 per cent on tangent track with dry rail, and there appears to be little, if any, tendency for driving wheels to "creep" under these conditions. Some "creep" is experienced in entering and leaving curvature. With poor rail conditions some "creep" with no attendant loss in train speed is experienced on tangent track. In heavy curvature, however, the degree of creep encountered results in train speed loss of one to two m.p.h. Average all-weather running adhesions of 15 per cent to 16 per cent in track involving curvature of 8 deg. to 10 deg. have been found to be practicable.

No noticeable differences in operable adhesion values as affected by driving wheel diameter have been observed. The new locomotives have 42-in. drivers while the older machines have 55 to 56-in. diameter driving wheels.

The extreme fineness of control afforded in both motoring and regenerating operations permits the ready use of the new locomotives in freight trains with any type of motive power operated, be it steam, Diesel-electric or the older types of motor-generator electric locomotives. Heavy freight operations involving trailing tonnages of 5,000 are worked with locomotives at the head, in the middle and at the end of the train.

Passenger trains of 14 to 17 Pullmans and a heating tender (the locomotives are not equipped with train-heating boilers) are handled up to speeds of 50 and 60 m.p.h., consistent with track limitations and passenger comfort.

While the motor-generator locomotive is basically a constant horsepower machine, lending itself nicely to the practice of peak-demand control by power dispatchers, it can be overloaded for short times as occasions and emergencies demand. Rail horsepowers approximating 5,800 have been secured on occasion from the new locomotives.

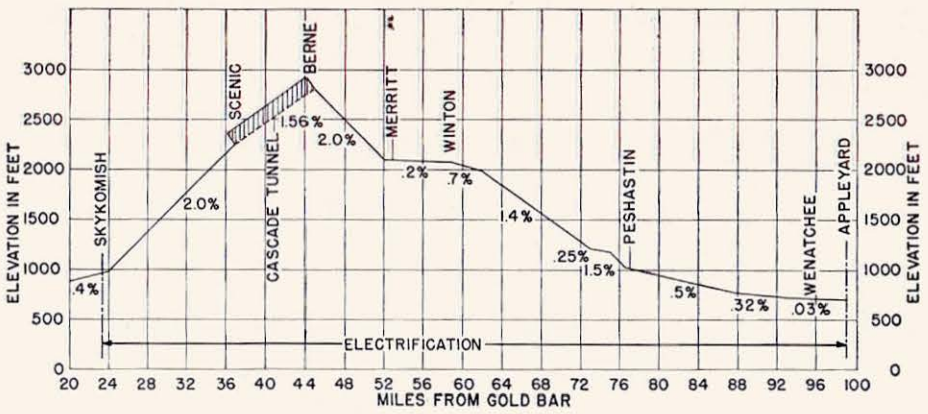
Power-factor control of the supply system is readily obtained by manipulation of the synchronous motor excitation on all of the motor-generator motive power. Unlike the Virginian operation, no induction-motored locomotives are operated, and the maintenance of unity to 0.95 leading power factor on the system is readily accomplished.

The efficiency of operation measured in terms of gross ton-miles per hour seems to be somewhat better for the new locomotives than for the older units. A figure of 6.8 g.t.m. per hr. per kw.-hr. at the substation on a 2.2 per cent grade holds for the new machines compared to 6.2 g.t.m. per hr. per kw.-hr. for the average performance of the older machines. Undoubtedly, this is due in part to the lesser weight per horsepower of locomotive (13.9) for the new locomotives, compared to 17.3 and 19.3 for the older machines. The new locomotives have all weight on drivers.

The use of the B-D-|-D-B running gear with four motored axles in each of the main truck frames gave rise to some question as to the effect the locomotives might have on the track structures. Observations during initial operations indicated that good tracking was being secured over the whole range of speeds operated. However, shortly after operation had commenced, some sections of track were reballasted in routine maintenance, and complaints developed that the locomotives were moving track in sharp curvatures.

Measurements were made which indicated no de-

Condensed profile of the electrified section of the Great Northern



flection at speeds above 30 m.p.h. However, at speeds of 10 to 15 m.p.h. permanent deflections of the track toward center of curvature of as much as ½ in. were recorded, when drivers No. 3 and 10 moved by the recording point. These observations indicated that the initial resistance (24 per cent) of the variable resistance centering device was too high. Pending installation of new roller plates, temporary relief was secured by removing the wear plates from the journal boxes and pedestals on drivers No. 3 and 10 which increased the lateral to approximately 1½ in.

New roller plates were supplied which reduced the initial resistance to 18 per cent building up to 20 per cent in the first inch. With these changes, the locomotives have been operating satisfactorily.

Some interesting observations of the added train resistance occasioned by the "piston-action" of trains in long tunnels have been made. Comparing train power demands, as indicated by the locomotive metering equipment, approximately 7 per cent more power in motoring is required to move a train against the tunnel grade than is required for operation at the same speeds on open grades of the same severity. The amount of regenerated energy is affected to the same degree and less energy is required to held a train at given speeds in the tunnel than is required for similar grade and speed conditions in the open.

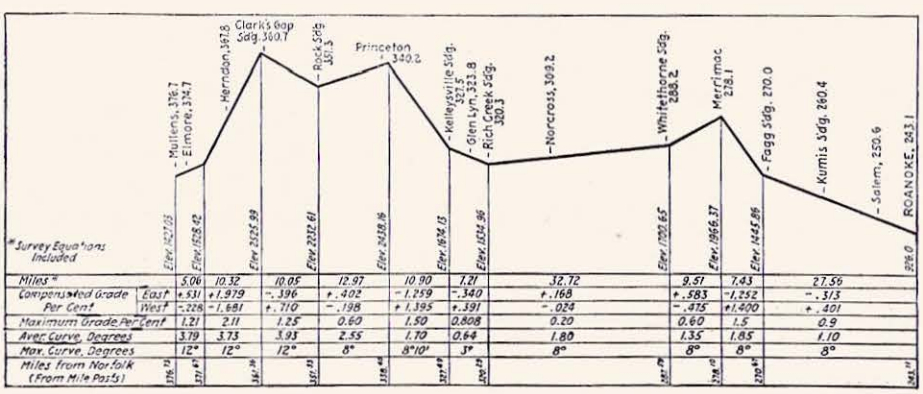
Observations of the train resistance added by 4 to 6 in. of snow on the tracks indicate an increase of resistance of approximately 15 per cent. Rail sanding is kept at a minimum since tests indicate that train resistance may be increased as much as 10 per cent by the over-liberal use of sand in starts with heavy trains on heavy grades.

Operation on the Virginian

The electrified section of the Virginian's lines extends eastward from Mullens, W. Va., to Roanoke, Va., 134 miles, traversing heavy mountainous territory crossing the Appalachians with a maximum ruling grade eastbound of 2.07 per cent. The line is single-tracked except 22 miles of double-track eastward from Mullens. The 11,000-volt, 25-cycle, single-phase system was installed in 1925 and, until the recent acquisition of motor-generator locomotives, has been operated with two-speed (constant speed at 14 and 28 m.p.h.), 6,000-hp. induction-motored locomotives.

These locomotives were entirely satisfactory for heavy tonnage movement, but there was a substantial development of time freight business through the years, and when additional power was considered, it was decided that a variable speed locomotive would be the most practical supplement to the locomotives in service. The basic operation for which motive power is designed is the eastward movement of 3,000 tons per locomotive from Elmore, W. Va., to Clarks Gap, W. Va., a fill-out to 9,000 tons at Clarks Gap, and the completion of the run with 9,000 tons per locomotive to Roanoke, Va. The induction-motored locomotives satisfy these requirements and the motor-generator locomotives were purchased for the same service demands, for operation

Condensed profile of the Virginian's electrified section between Mullens, W. Va., and Roanoke, Va.



singly or doubled with the older motive power. The four motor-generator locomotives secured from General Electric were delivered early in 1948, and have in their operation complied fully with the functional specifications.

The motor-generator locomotive has a very large number of running control steps available through the relatively fine generator-field control and various combinations of series and separate excitation of traction motors. This permits accurate control of acceleration and regenerative braking, the acceleration control making for ease of operation when doubled with the constant-speed locomotive, and regeneration control greatly reducing and, with certain tonnage and grade combination, even eliminating the need for air braking.

Voltage and power-factor conditions on the contact system have been improved with the synchronous motors utilized for main-set drive in the new locomotives. Unity or near unity power factor is secured through control of motor excitation.

Some trouble was experienced with the appearance of excessive voltages on the secondary side of the locomotive transformers, coincident with operation of the 11,000-volt oil circuit breakers on the high-tension side. Normal secondary voltage supply to the synchronous motors is 1,550 volts, and synchronous-motor contactor supporting insulators normally rated at 10,000 volts were breaking down under these conditions. Klydonograph tests indicated the presence of surge voltages with peaks as high as 16,000 volts — a ratio of 10 to 1 over normal steady-state voltage conditions. The installation of resistance contacts on the oil circuit breakers, and capacitors on the primary side of the transformers served to hold the surge voltages within acceptable limits.

The main motor-generator sets developed resonant-frequency phenomena, first manifested in shaft-coupling troubles. It was developed that the natural period of torsional vibration of the rotating structure of the locomotive motor-generator sets occurred within the single-phase power pulsation frequency (normally 2 x 25 = 50) of the supply system, and that in passing through or operating at certain system frequencies, the rotating masses were being subjected to excessively high torsional stresses. The phenomena first became apparent in loosening of the couplings and "fit" corrosion of the coupling bolts between the synchronous-motor and generator shafts. Further investigation developed that the high torsional stresses had fractured the outside dovetails in the synchronous-motor field punchings and end castings, where these dovetails fitted into the retaining slots in the shaft forging.

The natural frequency of the rotating system was changed to a value of approximately 39 per second — well below a value corresponding to the minimum frequency experienced on the power supply system — by reducing the diameter of the synchronous-motor shaft in its bearings from 10 to 9 in. Entirely successful operation has been secured subsequent to this change in shaft dimension.

Bill Schmidt Reports on Britain's Railroads

W. H. Schmidt, Jr., *Railway Age's* transportation editor, located ordinarily in our Chicago office, is putting in a few weeks in Great Britain—to see how things are going with the nationalized railways. Here is his first letter, written a couple of days after his arrival.—*Editor.*

LONDON, JULY 17

DEAR BOSS:

This first impression of Britain and her railways must be grounded, I fear, entirely on hit-and-miss, personal observation, for having arrived in London late on Friday of a hot-weather period, I have yet been unable to see any of the British railway officers. This past week-end I have been re-gaining my "land legs" by roaming about this vast city, from one terminal to another, alone and unassisted (and, therefore, "unbriefed") seeing, in the flesh, those famed funnels of humanity—Paddington, Euston, Kings Cross, Victoria and others—to which Sherlock Holmes hied off with the good Watson at the least provocation. And I experienced a fast ride on a "boat train special" from Liverpool to London on the Midland region main stem, said by many British railroaders to be the finest piece of track in the country. Its 60-ft. rails also give out a rhythm greatly beloved by the "fans" here. This, plus a few quick turns on Southern suburban electrics, is about the extent of my experience thus far.

It is as though a Britisher were to land at Baltimore; ride his first American train to New York; and then spend the week-end looking over Grand Central, Penn Station and the ferry-connection terminals over in Jersey, with a couple of runs out on the Long Island and a long, awe-struck stop-over at Jamaica. He wouldn't know much about the problems of American railroading.

There is little point in repeating the outward differences in British practise and design which strike the visiting American most strongly. The thousands of Yank soldiers who were here in the war have made most Americans aware of the smaller profile of the rolling stock; the high-pitched "hooters" (some L.M.S. fast passenger locomotives have deeper whistles); the smooth starting and stopping (of passenger trains only, I hasten to add!); the surging effect of the vacuum brake; the tiny freight cars; the tank-type switch engines; and compartmentation of passenger cars.

Enormous, Incessant Passenger Traffic

Of more interest at this time is the general appearance of the British roads as a transportation machine, without reference to any national characteristics.

By far the most dramatic feature of Britain's railroads is their enormous, incessant passenger volume. We have at home, to be sure, suburban volume on the Long Island

and Illinois Central, for example, which impresses even Londoners. But you should have stood with me this morning (a Sunday, when British schedules are greatly curtailed) at Clapham Junction, in the southwest of London, where lines of the Southern join to form a transfer station with 17 platforms and some 25 separate running tracks. Almost every few seconds, trains of 10 to 12 cars wheeled by, corridors jammed and excess passengers standing in the compartments, bound for seashore points like Brighton (50 miles) and Portsmouth (96 miles). The day preceding, Saturday afternoon, I watched a long-distance train from the "Cornish Riviera" or Wales steam into Paddington on the average of every four minutes for three hours—filled with passengers returning from their week or fortnight holidays (they daren't wait for Sunday).

On Saturday morning the great concourse of Waterloo was filled with long lines—or queues—of prospective passengers, standing in formal array before portable signs which read, for example, "Queue Here For Basingstoke, Southampton and Bournemouth." To keep from fouling the movement of the thousands of other passengers scurrying about the great station, these queues were formed in taxi drives, baggage areas and any other "marshalling" space which could be found. Then, shortly before train time, the whole long line of travelers, toting baggage, tennis rackets and babies would dutifully snake its way through bicycles and piled hampers, marching behind a dignified gateman.

Employees Courteous; Fares High

In general, station and train employees who deal with the public here are very much busier than their counterparts in the States; I must admit that they also appeared on the average somewhat more conscientious; anxious to keep conditions fluid; and are exceedingly courteous. These highly desirable qualities must be ingrained—an inheritance from pre-war and pre-nationalization days—for one would think that the sellers' market which the British roads *appear* to have in passenger traffic, plus the "let-down" from government seizure under a labor-dominated government, would, otherwise, have produced an attitude either of indifference or officious bullying (evident on the German state railroad system both now and for many years past).

The ordinary one-way fare here is high. It would provoke moans of anguish in the high-income United States; here, where average earnings are lower and where dependence upon railroad travel is very much greater, the rate would be murderous, except for the fact that almost nobody except American tourists rides on it. Britishers use round-trip tickets, at the very most, and many use even cheaper bargain fares for specified trains, days or districts which bring the mileage rate down to the American level, or below. But the ordinary people I've talked to here think the fares are very much higher than they can afford; they pay them only because they *have* to get away for a holiday.

I'm told that passenger traffic here is declining; if what I have witnessed is a *drop* in business, I should indeed like to have seen these railroads in their heyday. Wow!

At any rate, the nationalized lines appear to be merchandising themselves to the hilt—whether to fill trains or to keep in good with their new "owners," I don't know. I note on a station sign that the railroads as a whole now operate 1,400 scheduled, open excursions a month. There are scores of "run about" ticket offers, by which the passengers pays 15 to 20 shillings ($3 to $4) third class for the privilege of hopping on and off trains at will within a restricted resort area for a week. And, as always, the station travel posters are handsome and enticing. Our own roads have lots to learn along these lines.

All the way over on the Canadian Pacific steamer, on which at least half the passengers were British, people kept volunteering their opinion of the nationalized British railroads. Without exception, they said the service is bad, the rates extortionate and the rolling stock and stations dilapidated. In each case, I asked them to consider the effect of the war. Yes, even then, they asserted, the condition of their railways is much worse than it ought to be. Then, in each case, I raised the question whether the roads would have renewed their vigor faster under private ownership. Almost everybody thought that business "know-how," unhampered by either politics or over-centralization, would do a better job, faster. A few even brought up the necessity for competition between roads, which they said, was very strong and efficacious before amalgamation in 1924 and which constituted a fairly effective—though much weaker—spur to enterprise up to World War II. One old gentleman claimed that the "wonderful" work of the Southern in building up a superb—and profitable—short-distance passenger traffic with electrification, line changes and frequent schedules was all the proof he needed that private ownership is good for the public.

Others of my fellow passengers at sea, while they deplored nationalization, thought it inevitable. They had the idea that only government could get the capital the properties needed.

It is significant that nobody at all brought up the necessity for equalizing public support and taxation of the railroads and highway transport in Britain. The nationalized railroads here have still to do the same educational job with the electorate that the privately owned railroads have before them in the States. If they don't do it, they face, I am certain, the accusation that railroads are more costly and less efficient than highway transport. You and I know that such a judgment would be unfair, and that highway carriers have none of the property or burdens of the railroads. Although the government now owns and runs the railroads here, it is still at a great disadvantage in competing with trucks and busses. For the sake of the science of railroading as a whole, I would like to see the nationalized railroads of Britain cast out the lie that movement on steel rails is costlier or poorer than on macadam.

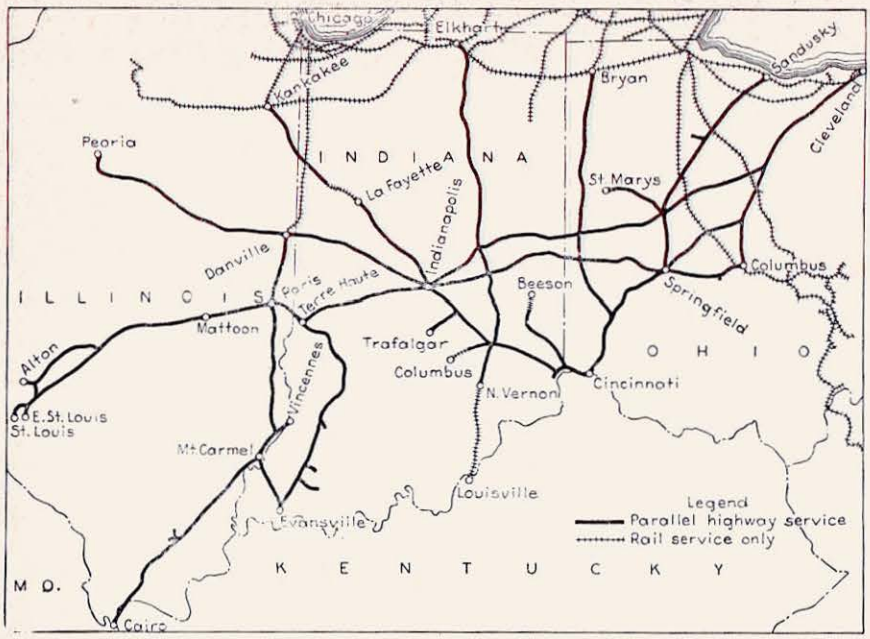
"Too Many Boards"

I am prompted to this expression of feeling by a conversation I had just this evening over a cup of tea in a "refreshment room" with a serious, studious gentleman, retired on pension. Despite his great age and natural love of old things, he shocked me by declaring categorically that railroads are out-of-date and ought to go. Whether consciously or not, he aped the attitude of a well-known British Socialist who, while helping to preside over the liquidation of the private railroads, jeered that his country was buying a "very poor bag of assets." "Why," said my aged companion, "just look at the dilapidated station here in this suburb; they haven't spent a bloody 'a' penny on the ruin for 50 years." Almost in the same breath he observed that the busses are cheaper and that, conveniently, they run all over town. I hadn't the heart to remind him that the bus stations are not dilapidated, because there aren't any; the highway carriers hadn't gone to the expense of building them at all.

This aged critic of the railroads, by the way, claimed to be a strong ally of the Labor Party. He had put great hopes in nationalization of the "big industries," but thinks the mines and railroads and other government enterprises fail to pay or provide good service because "there are too many damned boards, with high salaries, taking up all the money." With their meddling they keep the old management, held over from private ownership days, from running things right. "The boys on the line got away from the directors—Sir Nincompoop, earls and dukes and other loafers—only to get under the thumb of something bigger and more expensive—the bloody boards."

As for me: I think the British are unduly hard on their railroads—nationalized or no. The carriers may be a lot worse than they used to be, but to an American—just off

(*Continued on page* 52)



Solid lines indicate l.c.l. highway service parallel to rail lines, and demonstrate how the service blankets the New York Central's Big Four district

N.Y.C. Establishes L.C.L. Truck Service Over Three-State Area

Coordinated service utilizes advantages of rail and highway transportation to furnish a fast, reliable merchandise service to 400 Indiana, Illinois and Ohio communities

Highway handling of less-than-carload freight has been inaugurated over 5,218 daily route-miles by the New York Central in its Big Four district. By substituting trucks on parallel highways for "peddler" cars on local freights, the road not only has quickened l.c.l. service, but carload service, too, has been improved by the elimination of many of the time-taking operations of way-freight trains. Service performed daily by a fleet of 38 highway tractor-trailer units has released approximately 2,600 peddler car-miles daily.

Under the new system, 37 truck routes have been established parallel to most of the New York Central's rail lines in the territory which comprised the former Cleveland, Cincinnati, Chicago & St. Louis railway. The cities from which the Big Four took its name—with the hub at Indianapolis—define generally the territory which is involved.

Mechanics of the Operation

The truck routes generally are scheduled to cover just enough territory to permit a morning-to-afternoon turn-around, with the vehicles returning to concentration stations—points to which l.c.l. volume warrants daily merchandise cars—in time for forwarding outbound freight the same day. A few routes are covered by two trucks, each making a one-way trip each day, with drivers changing at the meeting points.

The trucks serve railroad stations only, and do not affect existing pick-up and delivery arrangements at intermediate points. The 38 trucks and the drivers for them are furnished under lease with private trucking firms. There is a separate contract in each of the states —Indiana, Illinois and Ohio. Operation of the trucks is controlled by the New York Central and the equipment is used exclusively by the road, to whose specifications it must comply. Under the contract, the trucking firms are liable for loss and damage of freight in their custody.

To illustrate how the service works, and what benefits are gained by its use, the Danville-Mt. Carmel route and the Terre Haute-Mattoon route, intersecting at Paris—and illustrated on an accompanying map—are described. Trucks leave Danville, Mt. Carmel and Terre Haute, respectively, at 9 a.m., loaded with freight for all intermediate stations. En route, inbound freight is delivered and outbound freight collected. The trucks are back at their final terminals before 5 p.m., in time for outbound rail movement of merchandise which they have picked up. Local freight trains between these points are relieved of burdensome station work and considerable switching, and crew overtime has been largely eliminated.

Heretofore, l.c.l. traffic moving from Louisville, Ky., for example, to any of six stations intermediate to Paris and Danville, was loaded to Indianapolis, transferred there to a Mt. Carmel car, and reloaded at that point into a tri-weekly peddler car for Danville, giving fourth to fifth day service. Such freight is now loaded to Indianapolis, transferred on the first day to a Paris car, and worked for delivery to the Mt. Carmel-Danville truck so as to reach its final destination late on the second morning. From St. Louis to these stations, service is *first* day, instead of fifth or sixth day, the freight being forwarded by rail to Mattoon, and transferred between trucks at Paris. From Chicago, service is second day instead of fifth to sixth day.

From New York and other eastern points the service is tied in with the fast "Pacemaker." Heretofore, New York freight was loaded to Indianapolis, reloaded to Mt. Carmel, and delivered on the tri-weekly car on the

fifth or sixth day. Service is now third day, on the following schedule:

lv. New York (33rd st)	NB-1	7:45 p.m. Tue.*
ar. Buffalo	"	6:50 a.m. Wed.
lv. Buffalo	"	8:00 a.m. Wed.
ar. Cleveland	"	1:45 p.m. Wed.
lv. Cleveland	ON-1	4:45 p.m. Wed.
ar. Indianapolis	"	5:00 a.m. Thu.
lv. Indianapolis	DF-1	5:45 p.m. Thu.
ar. Paris	"	9:00 p.m. Thu.
lv. Paris	truck	9:50 a.m. Fri.
ar. all points intermediate to Paris and Danville before		3:30 p.m. Fri.

*Sample day

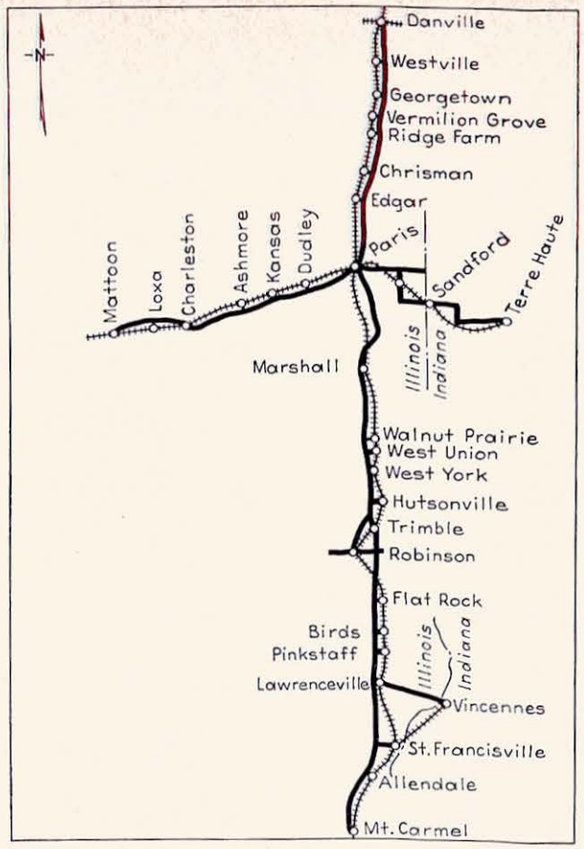
This fast service—not only to the points on the route chosen for illustration, but to most of the tri-state area—has proved so attractive that shippers wholly outside of New York Central territory have begun trucking westbound merchandise to New York, Boston, Worcester, and other "Pacemaker" pick-up points to take advantage of it.

All Hands Enthusiastic

The new service is designed to hold l.c.l. traffic to the rails and to give—with regularity—a service to the small and medium sized cities, towns and villages that is comparable to the service given the larger communities. Straight merchandise cars are being made from the more important shipping points, such as Cincinnati, Springfield, Ohio, Columbus, Cleveland, Indianapolis, Louisville, Chicago, Peoria, and East St. Louis, to the truck concentration points, providing first day delivery to the majority of stations on the Big Four district, with a maximum of two days from the more distant stations.

Agents and station forces are enthusiastic. The membership of the Order of Railroad Telegraphers, and of the Brotherhood of Railway Clerks, is giving its fullest cooperation in making the new service a success. "Our station forces," one union official stated to his membership, "are the 'super-salesmen' of the railroads, and we urge them now to display those qualifications in selling the new service in their respective communities." Most of the agents have sent individual letters to shippers in their territories, describing the new service as it affects their stations.

Studies are already under way covering extension of the highway service to other territories served by the N. Y. C., and such moves are under serious consideration—subject to longer experience with the Big Four operation, and pending approval of regulatory bodies.



The Danville-Mt. Carmel and Mattoon-Terre Haute truck routes intersect at Paris. Operation of these routes is outlined in the text

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The new highway operations are tied in with the "Pacemaker" for fast service to and from the east. Freight is normally transferred across the freighthouse platforms, but large single shipments are loaded direct into the cars

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1—44-Ton, 0-4-4-0, Diesel-Electric, General Electric, 380 HP, ICC Condition, 4 Traction Motors, Dual Controls

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4—100-Ton, 0-4-4-0, 600 HP, Diesel-Electric, ICC Condition, 4 Traction Motors

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7—Gondola, All-Steel, 50-Ton, 40'3", 2'11" Sides

25—Gondola, Drop Bottom, 50-Ton, All Steel, 40-ft., 5'1½" Sides.

5—Flat Cars, 40-Ton, 60-Ft., S/U

1—Flat Car, 50-Ton, 41'6"

1—Flat Car, 50-Ton, 43-Ft., S/U

1—Flat Car, 70-Ton, 36'6", Depressed Center Well Type

14—Dump, 20 Yd. Automatic Air, Lift Door

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By GLENN L. SHINN

Attorney-Examiner, Interstate Commerce Commission

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CONTENTS

Routing and Misrouting—General. Shippers' Rights to Specify Routing. Routed Shipments. Partially Routed Shipments. Unrouted Shipments. Ambiguous and Conflicting Instructions. Indefinite and Incomplete Routing Instructions. Reconsigned Shipments. Embargoes. Liabilities as Between Railroads. Damages. Recapitulation. Citations. Index.

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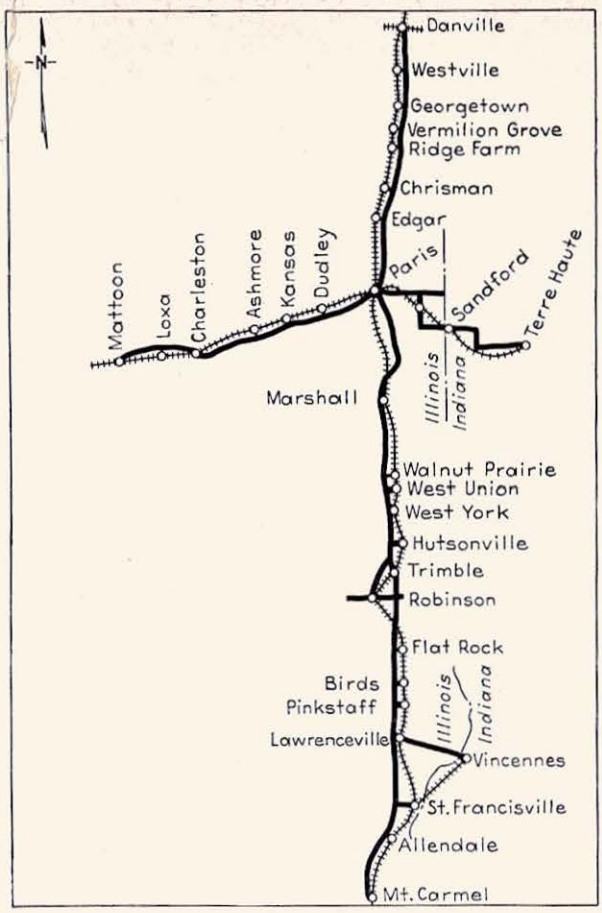

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A Way to Get New Capital to Finance Improvements in Railroad Plant

By FREDERICK C. FIECHTER, JR.*

The Philadelphia Plan railroad equipment trust enjoys a prestige which compares favorably with most inducements to investment. But it is anomalous that where railroad equipment is so easily financed,[1] the facilities on which that equipment operates are so difficult to finance[2]. The fact that, except for refunding operations and terminal bonds, practically no railroad stock or bonds have been issued for almost twenty years cannot be explained away simply on the basis that American railroading is not an expanding industry.

Nor is it a satisfactory solution to say that the federal government should own and maintain all railroad right-of-way. And yet that inference will be drawn by some of those who analyze the railroads' objections to the subsidy granted by government to other forms of transportation.

Increased rates will be complemented by more efficient operation to meet the competition. Vast strides have been made in the equipment field, particularly with regard to Dieselization. Much remains to be done on the right-of-way. For all but a few railroads the question is how to finance it.

The chairman of the board of the Norfolk Southern says, "I have been searching for a long time to find some method so that these plant improvements can be made; and trying to think of some idea to sell to the bankers. I do think this, that if the Interstate Commerce Commission would change its method of bookkeeping from original cost to cost of reproduction, or make an adjustment in between, so that depreciation of fixed plant meant something, somehow or other I believe we would be able to find a method, like the Philadelphia Plan, to finance such improvements as centralized traffic control, or any other additions and betterments, over a 15-year basis.

Improvements Must Promote Efficiency

"After all, railroads should not make these improvements unless they help promote efficiency. We might be able to dope out a scheme where we pledged our depreciation of plant account against the amortization of the bonds. I realize it would not be easy, because the first mortgage bondholders are going to cry, but unless we do something about it, how are we ever going to answer the I.C.C. annual report—which in effect says that rates are high enough: 'go out and improve your management and improve your plant.'"

The Author

Mr. McGinnis points out that the present depreciation accrual on plant is around $125 million. That is inadequate to take care of a $29,000 million plant—or even a $20,000 million plant, to use the commission appraisal. This $125-million figure, Mr. McGinnis says, is "laughable, and it has got to be changed if we are going to continue to exist and become more efficient."

"The railroads are predicting that over the next ten years they should spend between $750 million and $850 million yearly to keep this plant in the shape it should be in. Obviously, unless the present system is changed, that has to come out of net income. . . . I doubt if you can get any new venture capital into the railroads unless they modernize their bookkeeping system, so that when the management suggests the expenditure of so much money, it will have an answer for investors: i.e., Yes, it is sound, and we have a modern bookkeeping system of depreciation."

The application to fixed-plant financing of the tried and well-known Philadelphia Plan used for equipment is probably prohibited by both legal and market considerations. The after-acquired property clause in existing senior mortgages is avoided in the case of equipment because title thereto is never in the railroad until the equipment is fully paid for. This, of course, is not true in the case of existing trackage, bridges, and other physical plant which are already owned by the railroad and subject to existing liens. And, security-wise, cars and locomotives are easily moved and adapted to use on other roads if one lessor defaults, but plant is largely irremovable and not readily adaptable to other uses.

*The author is a member of the bar and an officer of the Pennsylvania Co. for Banking & Trusts.

[1]See "Financing Railroad Equipment Purchases" in *Railway Age* of February 7, 1948.

[2]A subject elaborated by Patrick B. McGinnis, chairman of the Norfolk Southern, at a meeting of the New York Railroad Club February 17, 1949, as reported in full in the club's "Official Proceedings" for that date and more briefly in *Railway Age* of February 26, page 48.

There are only four potential sources of these funds:

1. Earnings
2. The individual investor
3. The banks and insurance companies
4. The government

Most roads lack the blessing of sufficient earnings. Even if increased rates are authorized, they open the way to increased competition—and increased wages point up the necessity of labor saving where possible. The current annual wage of one sectionman will pay for the use of perhaps $100,000 for one year.

It seems to be pretty generally agreed that under present conditions the individual investor may be eliminated from consideration as a source of new capital for plant improvements. And few are prepared to recommend that the federal government take title to any right-of-way, especially to the main lines.[3] That leaves the big institutional investors.

The total investments of the life insurance companies alone in all types of railroad securities amount to approximately $3,105,000,000. As trustees of the people's savings they are interested in the long term stability and success of the users of their money.

In connection with the acquisition by a railroad of new fixed facilities (a bridge or terminal or building or spur or freight yard or pier), what is there to prevent one or several life insurance companies (probably not banks because of taxes and the term for repayment) from taking title to the real property and having the funds they advance for its acquisition amortized by sufficient rent from the railroad over a 30-year period? There could be options to renew extending perhaps for 100 years. The railroad would reserve a right of refusal to purchase back the property at a reasonable figure at the end of the period, all contingent on the approval of the Interstate Commerce Commission or the state regulatory body. The rental payments would be on a net basis, the railroad paying real estate and use taxes, fire and other insurance premiums, and cost of maintenance and ordinary repairs.

Evolution of Corporate Finance

The last decade has seen a major development of corporate finance evolve in the sale and lease-back of real estate and less frequently of personalty.[4] Charitable and educational institutions and insurance companies,[5] have been the usual purchasers and lessors. Retailing establishments have been the common sellers and lessees, or the lessees of property sold or erected by a third party. The agreement balances the credit of the tenant with the value of the real estate (taking into account location, construction, physical condition, and other use possibilities) and the interest factor and amortization schedule which the rentals will provide. Additions and betterments are provided for as leasehold improvements with their ultimate disposition provided for in the lease.

Increasing use of the method indicates the favor in which it is held even apart from tax considerations. The arrangement lacks a final tax clearance in any definitive fashion by the Supreme Court of the United States, but almost all of the statutes permitting insurance company participation have been enacted only in the last seven years. To what extent, if any, is this method a solution to the plant modernization problem of the railroad? That subject is explored in this paper in the hope that it will stimulate questions and answers from the experience of railroad and insurance lawyers and financial men.

In the commercial deals heretofore transacted no governmental regulatory body such as the I.C.C. or Securities & Exchange Commission has been a factor. They have involved so much less money that one institution could become the sole owner of a property without violating legal restrictions on total investments in one company or type of investment.

Advantages and Disadvantages

If the objection is raised that insurance company charters will not permit their entering into the railroad business, it is quite possible to let a trustee intervene and have the insurance companies buy certificates of participation.[6]

The potential advantages of this plan for the railroad are as follows:

(1) It furnishes capital for additions and betterments which are expected to result in lower operating costs and thus help the railroad's credit standing.[7]

(2) It may result in considerable corporate income tax savings both in taking a capital loss on the sale of the property and in increased deductions from current income during the term of the lease with carryback advantages to excess profit tax years. Until one of the transactions involving commercial building has been passed on tax-wise by the Supreme Court of the United States a railroad cannot be sure of the tax advantages in the absence of a closing agreement with the Treasury Department.

(3) It allows to some extent a refunding of existing relatively high interest bearing obligations with rent reflecting the lower return which investors are currently able to get on their money.

The potential disadvantages to the railroad are:

(1) The possible, if not probable, cessation of operation on failure to meet obligations. This is a greater risk than is involved in failure to meet equipment obligations since there would no longer be the opportunity to rob Peter to pay Paul. Peter and Paul will tend to be identical life insurance companies.

(2) Some hazard as to what the repurchase price will be at end of renewal options, or, stated differently, giving up title to the property.

(3) The rate for the use of the money might be higher than that usually paid on first mortgage

[3]Compare the plant facility arrangement in the manufacturing industry during World War II.

[4]The realty phase of this development has been brilliantly and exhaustively analyzed from the legal point of view by Professor William T. Cary in 62 *Harvard Law Review* 1 (November, 1948.). See also a paper by John W. McPherson, "Some Economic and Legal Aspects of the Purchase and Lease of Real Estate by Life Insurance Companies," read before the Association of Life Insurance Counsel, December 7, 1948, and "Long Term Lease Financing and Its Applicability to Electric Utility Companies" by William W. Bodine, an address to the Edison Electric Institute, June 2, 1949.

[5]Although life insurance companies report all rental payments as "income" for income tax purposes, their gross income is reduced by an authorized deduction, for maintenance of an appropriate reserve. Thus the corporate tax rate on their rental income is not so severe as in the case of other business corporations.

[6]There may be difficulty with some state insurance commissions where the investing insurance company is less than record owner of the real estate, but such insurance commissions might change their attitude if satisfied as to the security of the investment.

[7]Debt financing has a tendency to weaken the capital structure of the issuing company and the investment status of its mortgage bonds.

bonds, debentures, and bank loans—if the capital would be available on such basis.

4) Possible impairment of the rate base.

The potential advantages for the institutional investor are as follows:

(1) A fixed return and higher yield with relative safety of principal. While the investing institution may not have the general obligation of the lessee, it[8] has control in the event of default, subject to the public's right to demand transportation so long as it is on a basis profitable to the operator. Where the facility involves only a small part of the system the general obligation of the road might also be in order.

(2) A large field for funds.

Potential disadvantages for the institutional investor are:

(1) In insolvency proceedings its claim is limited and its rights are inferior to those of a bondholder or other lender, even though it does have title to the property.

(2) Unless the facilities are jointly used by several railroads, most facilities would be single occupancy properties.

(3) Possible impairment of tax exemption if it seems to be abused.

All but two of the more obvious objections are of the kind which have already been encompassed by past transactions. These existing transactions, however, have not involved real estate in more than one jurisdiction at a time and they have not involved such necessarily large sums of money.

The technical difficulties are legion, but not insuperable. Bankruptcy, reorganization, conflict of laws, the ultimate tax advantages, are all problems, but they are worth overcoming if it means a railroad can squeeze fifty years' depreciation into twenty years without sacrificing net earnings, and if a source of new capital is thereby opened up.

Now that equipment acquirement problems, financial and otherwise, are pretty much in hand, it is urgently necessary for financial and legal authorities to concentrate on ways and means of paying for capital improvements in railroad plant which the engineers and operating officers propose on the basis of effecting tremendous and increasingly needed maintenance of roadway and structures savings.

If tax uncertainties can be resolved, there would appear to be good reason why the sale and lease-back method should be readied—for a trial at least in the acquisition of new facilities or betterments. This would leave net earnings available for expenditure on existing facilities. The application of the method to presently owned real estate already subject to the lien of existing mortgages may be accomplished in time, but it presents difficulties too numerous and formidable to be dealt with here. Examples of these difficulties are the existence of non-callable bonds; transfer of title to railroad right-of-way and easements where the owner is not a common carrier; or need for I.C.C. acquiescence to something less than an absolute right in the railroad to purchase the leased premises at a certain price. Tax-wise the so-called "rejectable offer" is more desirable. This would permit the tenant railroad to request cancellation of the lease, provided at the same time it offers to purchase the property at a price equivalent to the lessor's unamortized investment in the leased premises, plus a premium of a specified percentage of the lessor's original investment. The lessor reserves the option of accepting or rejecting the offer, although in either case the lease is cancelled. Similarly, at the expiration of the terms, the insurance company could accept or reject the railroad's offer. But should this satisfy the I.C.C.? That is the question which must be answered before going further.

[8]Either one institution or, more probably, several acting through a trustee.

BILL SCHMIDT REPORTS

(*Continued from page 47*)

the boat—they appear to be doing a pretty good job. Perhaps I'm still wobbly from the motion of the sea; I may change my mind; but that's my opinion after two days' look-see.

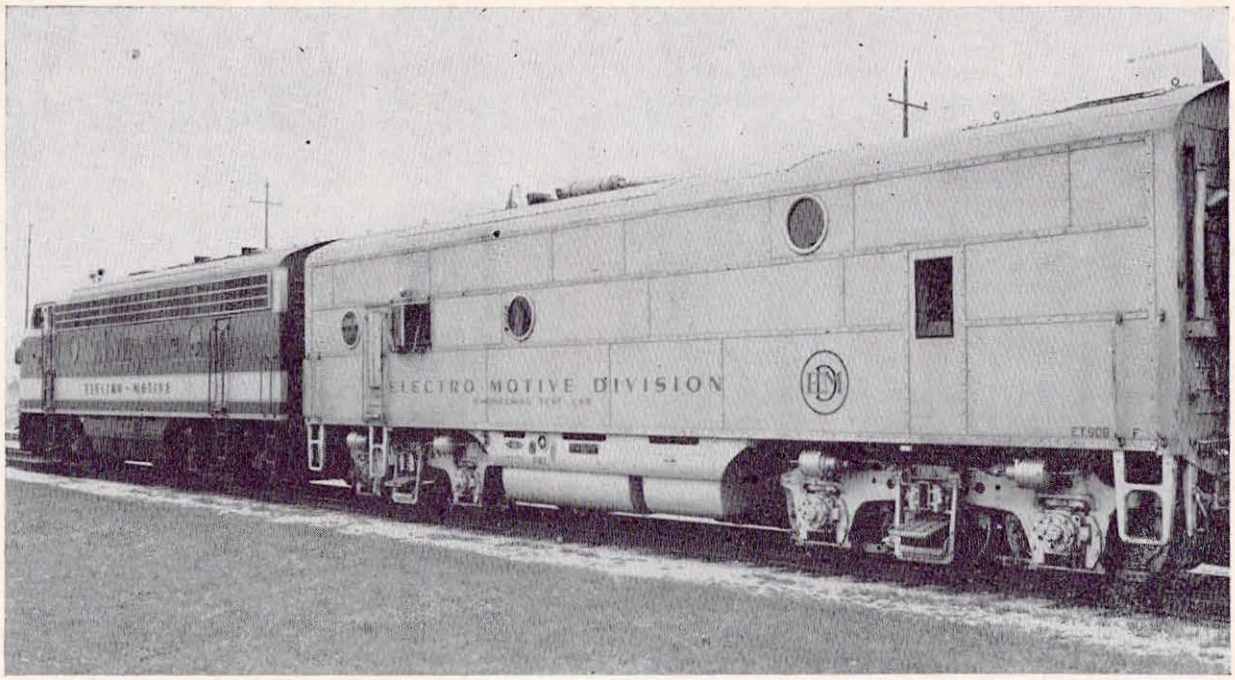
Next time I hope to be able to say something about freight traffic, and service which, I realize, has been ignored in this first communique.

You may already have the news that John A. Kay, publisher and editor of the British Railway Gazette, passed away on July 8. I haven't yet had time to call on his associates to find out the cause or to find out who his successor will be.

Tomorrow I make my first call on a British railroad officer. I hope I'll find these men as interesting to talk to as the hundreds of American railroad men who've admitted me to their offices. Of one thing I'm certain; the cigars won't be as good; I'm passing 'em out myself this time.

Your respectful leg-man,
BILL

More than 350 Railroad Enthusiasts participated in a recent 280-mi. rail-fan trip over Connecticut lines of the New York, New Haven & Hartford. Highlight of the trip was a stop at the railroad's Cedar Hill freight yard, near New Haven, Conn., to inspect all types of motive power and watch freight cars go over "the hump"



Electro-Motive engineering test car

A "ROLLING LAB" ON THE HIGH RAILS

Electro-Motive provides engineering test car with electrical equipment to check all phases of Diesel locomotive performance under service conditions on the road

The Electro-Motive Division, General Motors Corporation, has developed during the past year and recently placed in service an engineering test car which can be cut in between any two units of a Diesel locomotive and used to indicate or record practically every phase of locomotive performance capable of measurement by sensitive electrical instrumentation. This "rolling laboratory" promises to extend research and test work on Diesel-type motive power far beyond the confines of stationary laboratories and furnish information of the greatest value both to railroads and to the locomotive builder.

The idea of the test car originated at the Electro-Motive Diesel Locomotive Development Center, La Grange, Ill., about a year ago. Heretofore, rail tests of this type of power had to be made with portable instruments, but test engineers were not altogether satisfied with such equipment. There just was no place in a Diesel to house sufficient equipment to make extensive tests before the advent of the car. In addition, many of these portable instruments operated too slowly to record the fastest pulsations necessary to supply a true picture of what was going on, which the technicians wanted to know.

The test car, consisting of a B-unit with all motive power equipment and controls stripped out, is provided with suitable crew quarters and a full complement of electrical test equipment, such as potentiometers, volt meters, oscillographs electrically operated counters, cathode-ray oscilloscopes and different types of timing devices. Many of these are specially built to pick up automatically phenomena occurring at some point in a locomotive only occasionally over a period of time, while the function of others is to record the fast-fluctuating electrical impulses heretofore impossible to put on a graph.

Test Car an Independent Unit

By simply coupling this complete car—an innovation in the Diesel testing field—between any two units of a locomotive, the instrumentation can be brought into play upon adjoining units of the power equipment while the locomotive is in service under all cross-country

operating conditions. The test car is complete in itself and does not depend upon other units of the train for operating power. It can therefore be cut in at any point on the train—between freight or passenger cars if need be. Its equipment is operated with 110-volt current, developed by a separate Diesel-powered generator installed in the test car. However, no provision is made for the car to move under its own power.

No outside contact is needed for operation of the test car except picking up fuel for the Diesel engine and food and water for its occupants. Thus, for special tests, the car can be stationed in a yard or out on a siding, unattached for days.

Test Data Secured

As soon as the car was developed and outfitted, it was put in service, testing present model locomotives; it played a big part in road checking the General Motors F7 Diesel freight locomotive and the E8 passenger locomotive. Between Electro-Motive assignments, the test car will serve railroads by supplying them with operating information, not heretofore available. It is providing technical men with many of the answers to engineering questions in visible graph form.

New, accurate recordings can be made, for example, of such things as train speeds, drawbar pull, oscillation of truck parts, axle side play, air-brake pressures, temperatures of journals under all operating conditions and temperatures of engine oils. Likewise, the temperatures of traction motors and the motion and stresses of various parts can be recorded on tapes by the mile, by the minute and at the varying speeds of operation. The behavior of Diesel engines is now graphed at varying elevations. Recent experiments in this line have determined the exact loss of power at altitudes ranging from 604 ft. above sea level to heights of 10,420 ft. A strain-gauge application to one of the drawbars to measure locomotive tractive force is being perfected.

Special equipment in the test car includes overhead speakers connected with many parts of the car or with phone cables to various parts of the locomotive itself. Heaters and cooling equipment contribute both to the comfort of operators and the ability to maintain uniform temperatures when necessary. Standard connecting doors permit passing either to the locomotive unit ahead or the one behind the test car. Wire conduits lead in both directions carrying the major electrical cables to outlets at both ends of the car. Here, they are easily connected with standard couplings to the equipment to be tested ahead or behind or both.

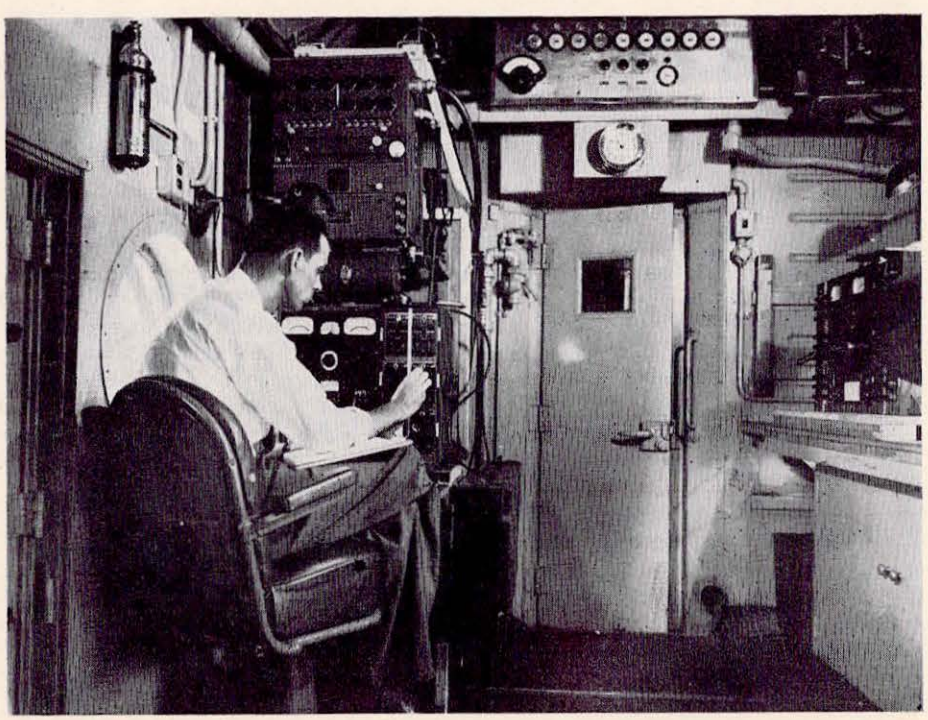
Two swivel chairs are provided alongside V-type bay windows for test observers to note mileposts and, by pressing a button, make suitable marks on the recording tapes. Automatic window wipers aided by a special washing spray for heavy weather insure clear vision. The window bays are fitted with special spot lights and the interior of each is curtained off for night operation to improve outside visibility, by blacking out interior lights. Mileposts along the right of way are easily spotted from these vantage points for accurate location checking.

Truck Inspection Simplified

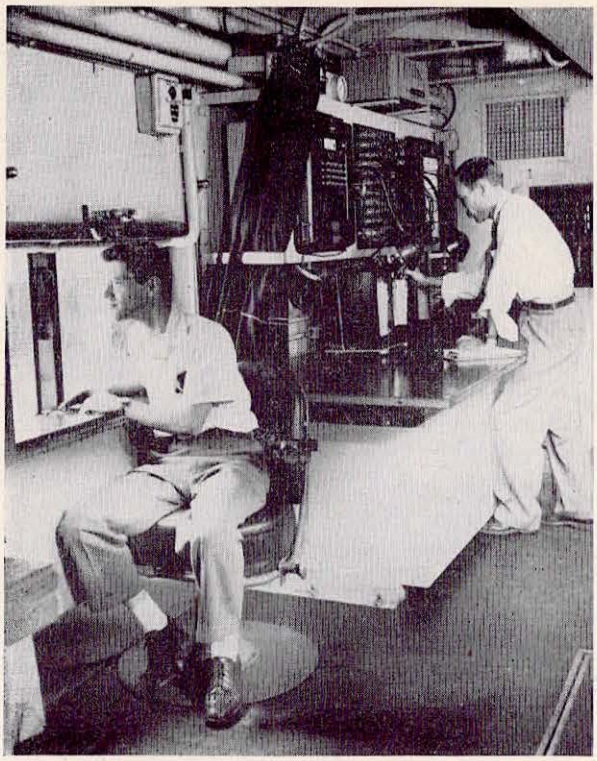
Floor hatches underfoot make below-the-floor visual inspection of the car trucks a simple operation with complete safety from the car interior. These offer both truck center and forward inspection points.

Compactly fitted into one side of the car is the power plant with its generator and cooling fans. The Diesel engine is supplied with fuel from the standard locomotive tank mounted under the car floor between the trucks.

Down the center companionway is a well-equipped



Speedometer, electrical counters and timing devices are shown above the door. Apparatus in the foreground includes an oscillograph above with control units below. Both electrical recording and telephone connections can be made with any other sections of the train



Mileposts along the railroad right-of-way are clearly visible through the V-type bay window. The test engineer at rear is making a notation on the speed-recorder tape

dark room with stainless steel tanks and compact cabinets supplied with paper, developer, hypo and all the other essential chemicals to do a reproducing job enroute. There is no waiting for results until the trip is completed with the photographic equipment aboard.

A well-stocked galley, shower, toilet, lockers and four standard Pullman berths add to the comfort of the crew members. Likewise, air-cooling fans make it possible to use the car in temperatures where the heat would be highly uncomfortable and hamper the work.

Effective Road Tests

The test car has already proved its value on one Class I railroad where the assignment was to check the flow of power application to the driving motors of a Diesel locomotive. Previous tests with portable instruments had not provided the desired information. Then the test car was coupled between two locomotive units and its instrumentation set up to record on graph paper any abnormal condition in the electrical transition system.

The instruments in the test car supplied test data for 480 hours of train operation under all possible conditions. The accumulated time in which the recording mechanism automatically went into action amounted to only a few minutes, but in that time the oscilloscopes recorded data which would otherwise have required months of tedious field survey work and testing. In reality, the phenomena itself occurred in a small fraction of a second, too fast for the human eye to note impulse changes.

Another important aspect of the test car and its apparatus is the ability to measure electrically the full effect of precision adjustments in the locomotive which can be produced only in rail service and which are impossible to duplicate in any stationary laboratory.

Most of the recording devices in the test car were supplied by instrument makers, Electro-Motive building only such special instruments and test equipment as were not commercially obtainable.

IMPROVING THE RIDE

(*Continued from page* 41)

train. The action of the draft gear with which our cars are equipped, which allows the cars in the train to be started serially, is essential.

What must be avoided is what is called free slack as differentiated from the relative motion that can be obtained from the draft gear, which is sometimes called controlled slack. On our older equipment with the type of coupler then in use there was slack in the coupler between the knuckle of one coupler and the pulling face of the other. This free or uncontrolled slack was one of the main causes of rough starts and stops. The introduction of the tightlock coupler, which absolutely eliminated this free slack in the coupler, has done much to improve conditions in this respect and enable trains to be started without jerking.

After the train has once been started smoothly and brought up to speed, it may be necessary to slow it down for various reasons such as the speed limit on a particular curve or bridge. Here proper handling of the brake is essential. To insure smooth operation under such conditions, power braking should be employed; that is, the brake application is made without closing the throttle. This prevents the cars in the train from being bunched so that when the brake is released, no jar or shock is felt as the speed is increased.

Proper brake handling is also essential in making stops. It is considered best practice to continue using power until just before the actual stop, gradually easing off on the power and making a light application of the independent brake to bunch the train. In this manner a smooth stop can be made and, what is just as important, the train is stopped so that it is in the most favorable condition to insure making a smooth start.

In all the various phases of train handling, the human element is a dominating factor. The best of equipment and roadbed cannot compensate for improper handling of the throttle and brake. A skillful engineer, however, may do wonders with poor equipment. With a good man in the cab a train can be handled smoothly with any type of power, Diesel, steam or electric. Conversely the fact that a Diesel locomotive is on the head end is not in itself a guarantee of a smooth trip. I have been shaken up just as badly with a Diesel on the head end as I ever have with steam. It is, however, easier for a less skillful engineer to make a smooth start with a Diesel than it is with steam. He has only one controller handle to operate and doesn't have to worry about the proper manipulation of the throttle and reverse lever.

GENERAL NEWS

3-Day Mining Week Cuts Coal Loadings

Gass report also notes how bituminous stocks are dropping

With the major portion of bituminous mines temporarily on a three-day week and anthracite mines averaging four days weekly, revenue car loadings of coal during recent weeks have been considerably below normal levels, Chairman Arthur H. Gass of the Car Service Division, Association of American Railroads, said in his latest monthly review of the "National Transportation Situation." As of June 1, bituminous coal stocks were approximately 72,750,000 net tons, representing a 57 days' supply, Mr. Gass noted. These stocks have since been reduced by work suspensions, he said, and the three-day work week is estimated to be depleting the supplies at the rate of about 3,500,000 tons weekly. As of July 9, bituminous coal production was down 12½ per cent as compared with the same period in 1948, he noted.

Mr. Gass' report was more favorable in regard to the lake coal and ore programs, where the movements are running somewhat ahead of last year. He did say, however, that the three-day week is beginning to have an "adverse" effect on the lake coal tonnage. Barring later difficulties, he continued, the ore program of 85 million tons should be met by the end of the season. Mr. Gass reported "no relaxation" in the movement of export coal overseas up to the end of June and added that it now appears that about 18 million tons will be exported during the current year.

Of the hopper car situation, he noted "little change" and that as of July 1, Class I roads showed an increase in ownership of 27,750 hoppers compared with a year ago.

As to gondolas, the C.S.D. chairman said no "serious" difficulties have been reported although "tight" situations have occurred in some sections. Demands, he said, are rather heavy for 65-ft. gondolas to protect pipe and other steel production shipments.

Requirements for plain flats continue "moderately" heavy, Mr. Gass noted. Because some midwestern roads have been short of 50-ft. and longer types, it has been necessary to move these from the East and South into the territory west of Chicago and St. Louis, Mo., he added. Noting that the railroads are making "special efforts" to fill orders for well and depressed center type flat cars, Mr. Gass called attention to the limited ownership of such cars and urged receivers to cooperate with the roads and his office by releasing the cars promptly. Loadings of covered hoppers are running "slightly" ahead of last year; however, the report said that the available supply is about equal to current requirements.

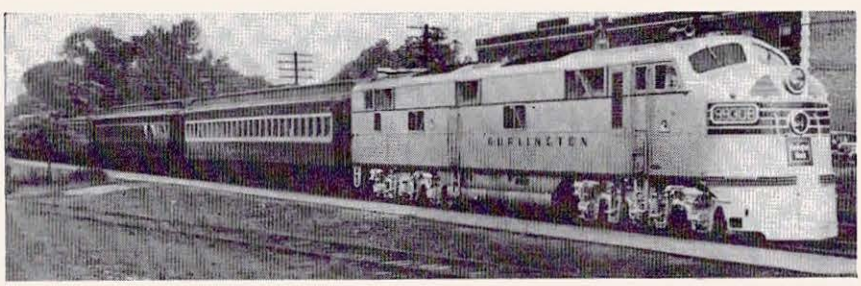
Box Car Supply "Adequate"

Of the box car supply, Mr. Gass termed it "entirely satisfactory" as the season's peak loading period nears. Demands for box cars, he said, are at a lower level than they have been at any corresponding period in recent years. Box car shortages for the week ended July 9 averaged only 1,898 cars per day, compared with 4,837 cars in the same week last year he reported. The box car supply was "entirely adequate" to move this year's harvest, he continued, and "less difficulty" was experienced this year than in any of the past 6 years of banner winter wheat crops. CSD Embargo 52, he continued, "prevented available storage space at principal markets from becoming jammed, and cars of wheat arriving at the terminals were handled in an orderly manner without delay."

A sufficient supply of ventilated box cars was maintained at all times this season to handle the watermelon movement from the Southeast district, he continued. Because the roads handled these cars expeditiously and returned them promptly to home lines, he said it was necessary to use only a very limited number of stock and refrigerator cars. He anticipated no car supply difficulties with respect to the melon movement from Georgia and the Carolinas. As to refrigerator cars, Mr. Gass said the supply is sufficient for current requirements in all producing areas. He called attention to the fact that this year's loadings of perishables up to July 9 were off 5.6 per cent from the total for the corresponding period last year.

Equipment-production data included in the report showed that installations of 9,121 freight cars by Class I roads and their affiliated refrigerator car lines in June were partially offset by retirements of 7,060. There were some net losses by types of cars, but net gains included 356 refrigerators, 2,241 hoppers, and 49 covered hoppers.

Average turn-around time for freight cars was 16.12 days in June, compared with 13.26 days in June, 1948. The number of cars detained beyond free time averaged 19.45 per cent of the total placed in June, compared with 16.51 per cent for June, 1948, and 15.48 per cent for June 1947.



Diesel-powered, air-cooled suburban trains are making their appearance on the Chicago, Burlington & Quincy at Chicago as a result of the road's $8,500,000 commutation improvement program (see *Railway Age* of February 19, pages 46 and 51). Suburban train service is slated to be 75 per cent Dieselized within the next few months, and modernized air-cooled coaches are being turned out of the railroad's shops at the rate of one each week. Final design and engineering is progressing on the Burlington's fleet of 30 new stainless steel, air-conditioned gallery-type cars for suburban service, which are to be built by The Budd Company, with deliveries scheduled to begin in 1950

Safety Requires Third Man on Diesels, B. of L. F. & E. Says

The type of work, including responses to emergency alarms, performed by firemen on Diesel-electric locomotives comprised most of the testimony presented last week by R. A. Pike, a traveling engineer for the Chicago, Milwaukee, St. Paul & Pacific, to the three-man "fact-finding" board which is holding hearings in New York on the demands of the Brotherhood of Locomotive Firemen & Enginemen for an extra fireman on Diesel-electrics.

Mr. Pike, who appeared as a witness for the B. of L.F. & E., after describing the nature of a fireman's response to alarms, added: "It must be understood that in addition to his engineroom responsibilities the fireman has to concern

himself with full observation of all operating rules. Discovery of the cause of the alarm and correction of its cause cannot be done from the cab. As soon as a fireman leaves the cab, the operation of the train is left in the hands of the engineman alone, in passenger service, and the engineman assisted by the head brakeman, as best he can, in freight service." This situation, the witness continued, "is inherently dangerous . . . While every effort may be made to insure safe operation by means of systems of signalling . . . no mechanical devices will ever substitute fully for the discretion, observation, judgment and response to the signal system that rests with the engine crew. This human element cannot be eliminated . . . The only practical method of reducing the human margin of error is to follow the time-tested principle that two heads are better than one."

When the fireman is back in the engineroom, Mr. Pike went on, and the engineman fails to note a signal indication correctly, or fails to see a rear-end flag, "there is no other competent employee to step into the breach and prevent serious consequences. Two legitimate questions now arise immediately: First, why cannot the headend brakeman be considered adequate protection as the second man in the cab and, secondly, if the fireman's presence in the cab is essential, why does he go back into the engineroom? I would answer the first question by saying simply that from my experience . . . I have yet to see any brakeman, regardless of experience, to whom I would confidently entrust the responsibilities and duties of a fireman, and, further, to whom I would turn over my personal safety by permitting him to assist the engineman in the operation of the engine.

One Pair of Eyes Not Enough

"With all due respect to him, the brakeman is simply not qualified to operate the engine and its controls. Lacking the training, he does not know, or knows only in the haziest manner, what to do in a crisis. Secondly, attention by the brakeman to his other duties on the train, which are many, precludes his continuous observation of right-of-way and signals. At the speeds which Diesel-powered trains, both passenger and freight, are traveling, it is unsafe to permit operation with only one pair of eyes on the track ahead. Two qualified employees, whose attention is not diverted by necessity to perform other duties, should be in the cab at all times, giving constant attention to conditions ahead of the train."

In answer to the second question he raised, Mr. Pike said firemen leave locomotive cabs even though they consider it unsafe, because their instructions, in freight service, require them to do so.

Howard Neitzert, counsel in the case for the railroads, during his cross-examination of Mr. Pike, asked the witness to state, "in the light of his extensive experience," "whether firemen in general prefer assignments to Diesel power or to steam power." Mr. Pike said: "I don't believe they would differentiate between them, particularly on the Milwaukee road."

The testimony of the next witness for the union, A. J. Chipman, general chairman for the B. of L.F. & E. on the Denver & Rio Grande Western for approximately 30 years, was for the purpose of emphasizing to the board that "firemen (helpers) are required to have a knowledge of the proper operation of Diesel locomotives sufficient to keep them in running order during the trip or day's work, that they actually perform this work on all Diesel-powered locomotives and that they are held to account for failure to perform this duty."

Seniority Rules, Regardless of Color

On July 22 the chairman of the Presidential board, George W. Taylor, announced the receipt of a request by the Provisional Committee to Organize Colored Fireman for permission to intervene in the proceedings. The request, submitted by A. Philip Randolph, international president of the Brotherhood of Sleeping Car Porters, in his capacity as chairman of the committee, and B. F. McLaurin, field organizer for the committee, said the B. of L.F. & E. "has a record of discrimination against Negroes unparalleled in American labor history . . . In the light of this discriminatory record, the provisional committee respectfully requests that it be allowed to intervene . . . to urge that any requirement that additional firemen be assigned to Diesel locomotives be conditioned upon the application of strict seniority rules in work assignments to firemen, regardless of the color of the particular fireman."

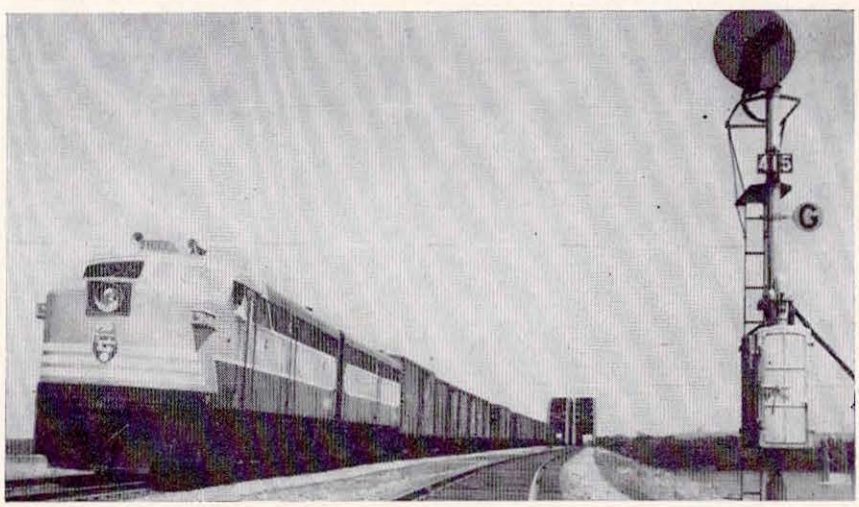
Mr. Taylor said the request to intervene had been denied, but that the board reserved the right, as it had in previous instances, to call upon the committee and other organizations for information if, in the judgment of the board, such action appeared to be desirable (see *Railway Age* of July 16, page 60).

Horace Bacus, who had testified earlier in the case for the union, (see last week's *Railway Age*, page 44), was again on the stand as this issue went to press. A spokesman for the railroads said at that time that witnesses for the carriers probably would begin their testimony late this week.

I.C.C. Bureau Wants Waybill Numbering on Block System

Methods employed and difficulties encountered by the Bureau of Transport Economics and Statistics of the Interstate Commerce Commission in connection with its so-called waybill studies were discussed by Bureau Director W. H. S. Stevens in his July 6 letter to Glenn F. Vivian, manager of the Statistical Bureau of the western railroads. The letter, which was in reply to "oral inquiries" from Mr. Vivian, has been made public by I.C.C. Secretary W. P. Bartel who said in an accompanying notice that the release was "deemed advisable" in view of the inquiries received from "various individuals and organizations" with regard to the "sampling methods and operations" used in processing the waybills.

The waybills involved are those being submitted to the bureau in response to the commission's September 6, 1946, order requiring Class I roads to file copies of audited waybills representing their carload terminations which are numbered "1" or with digits ending in "01." This sampling plan contemplated that every hundredth carload waybill would be received by the bureau, but it has not worked out that way because of the



Just over the St. Lawrence river on its way from Montreal, Que., to Newport, Vt., is the first of 23 Diesel-electric locomotives ordered by the Canadian Pacific for main-line operation between Montreal and Wells River, Vt. The locomotive shown consists of two 1,500-hp. units and is capable of hauling loads of more than 2,200 tons over Green Mountain grades. With delivery of passenger units in the fall, the 171-mi. section will be completely Dieselized

differing numbering practices of the various railroads. In his letter to Mr. Vivian, Director Stevens argued again (as he and his associates have contended in presentations to committees of the Association of American Railroads Accounting Division) that general adoption of the so-called block system of numbering would not only give the bureau what it wants, but it would make compliance with the filing order less costly for the railroads.

As Dr. Stevens explained, the block system and the other numbering system, which is based on a period of time, both follow a consecutive numbering plan, but differ in the method used to prevent the serial numbers from becoming too large. Under the block system, each station is assigned a block of consecutive numbers to be used (irrespective of the time involved) until the top number of the block is reached; then renumbering begins with the lowest number of the block. The other system is to number consecutively until the end of a stipulated period of time, such as a month of a year, and then to begin again with the first number of the series. One of the bureau's principal problems arises out of the fact that this letter system "always results in a larger sample than desired," Dr. Stevens said.

Sampling Difficulties

Using a monthly numbering system as an example, he went on to explain that the unwanted bills come from the small stations which issue less than 100 bills (perhaps only 10 or 15) in a carload series each month. "There will," Dr. Stevens continued, "be one number '1' bill every month and the remaining waybills will be numbered consecutively throughout the balance of the month. The only bills selected for the sample, however, will be the number '1' bills. This number '1' bill will be selected every month but since only one out of 100 bills is required it is obvious that the method will yield considerably more bills from each of such stations than the 1 per cent sample desired. As a matter of fact, on the average, the commission receives between four and five times as many of these number '1' bills as would be the case if all numbers in the block assigned to each station were run out before renumbering began."

Dr. Stevens next outlined briefly the bureau's method of overcoming the excess sampling. The method makes use of a so-called random process, which employs a table of random digits and which Dr. Stevens called "a matter of the higher mathematics of statistics and of probability." He added that the explanation is "fully set out" in the publication entitled "Table of 105,000 Random Decimal Digits," which was issued recently by the bureau as Statement No. 4914. After further comment on these "sampling difficulties," Dr. Stevens proceeded to set out his view that the monthly numbering system also results in "greatly increased costs."

"In the case of the commission," he said, "this occurs because of the added volume of bills and their handling and subsampling, which would not be necessary under the block system. Railroad costs are similarly inflated because approximately 90,000 excess number '1' waybills were transmitted to the commission for the fiscal year 1947-48, or approximately 30 per cent, over those actually needed. These bills are all discarded in the subsampling process because in effect they represent bills occurring at less than the hundred-bill intervals which is desired for the one per cent sample. These 90,000 excess bills and all the costs of selecting, adding supplemental information, and reproducing them would be immediately eliminated if all of the numbering systems were put on a block basis."

Proposal Rejected

Bureau presentations of the block-numbering proposal to the A.A.R. Accounting Division have thus far resulted in its rejection. The report of that division's Committee on Freight Accounts, which was approved by the division at its 1948 meeting in Cleveland, Ohio, had this to say about the matter: "The concensus of your committee [is] that the matter of assigning waybill numbers is a prerogative of the individual carriers and consequently should be left to the discretion of such carriers. Each road has adopted a numbering plan which it considers to be most convenient for its purposes and this numbering has a close relationship to its freight accounting system. Your committee has given full consideration to the over-reporting that the commission complains of and feels that this is no argument for imposing a uniform numbering plan on the railroad industry. Even an over-reporting of waybills to the extent of 30 per cent would mean only 1 1/3 per cent of the waybills rather than 1 per cent. The combined cost of producing and disposing of the over-reporting would fade into insignificance as against the additional work that would be imposed on the carriers through the handling of unnecessarily large numbers in their filing process and likewise in key punching information from such waybills. . . . There is the further fact that the adoption of the block numbering system would give no assurance that the amount of deviations as a percentage of the tolerance would be improved for individual carriers."

New "Railway Accounting Rules" to Be Published Soon

The next issue of the "Railway Accounting Rules" of the Accounting Division, Association of American Railroads, to be known as the September 1, 1949, edition, is expected to be ready for distribution "within the next several weeks," according to a July 20 announcement by Division Secretary E. R. Ford. The new or amended rules included in the edition will become effective September 1, and Mr. Ford's announcement said that "substantial" changes make it "essential" that copies be placed "in the hands of all officers and employees engaged in interline accounting work."

The announcement stated further that, pursuant to the usual practice, one copy will be furnished without charge to each railway accounting officer who is a member of the division, and additional copies may be obtained by member roads and their employees for 75 cents each when ordered in quantities of 10 or more, and for $1 each when ordered in quantities of less than 10. Prices to non-member roads and their employees are double the foregoing. Orders should be placed with Mr. Ford, Transportation Building, Washington 6, D. C., with remittances made payable to the A.A.R.

Committee Will Hear More From I.C.C. on Radio-Rules Bill

The House committee on interstate and foreign commerce decided this week to receive a further presentation from the Interstate Commerce Commission before acting on its subcommittee's version of proposed legislation to broaden the Interstate Commerce Act's section 25, which now includes provisions of the so-called Signal Inspection Act of 1937. The proposed legislation is embodied in a bill, H.R. 378, introduced by the committee's chairman, Representative Crosser, Democrat of Ohio, and the subcommittee's version includes amendments suggested by the commission but opposed by railroad labor unions supporting the bill.

As modified by the commission amendments, the proposed legislation would give the commission authority to require the installation of radio and other train-communication systems, but its authority to prescribe train-operating rules would be confined to rules "in connection with" such installations and installations of signaling devices over which the commission already has authority under the present law. The rules provisions of the original bill propose to grant the commission general authority over all operating rules. While opposing the whole bill, railroads have registered particular opposition to the rules proposal, their presentations having included statements from three presidents—F. G. Gurley of the Atchison, Topeka & Santa Fe, J. B. Hill of the Louisville & Nashville, and William White of the Delaware, Lackawanna & Western.

The only member of the I.C.C. to appear before the House subcommittee, which is headed by Representative Beckworth, Democrat of Texas, has been Commissioner Patterson, who advocated enactment of the bill in its original form, thus expressing the commission's view of that time. Thereafter the commission changed its mind and decided to propose the amendments which restrict the grant of authority over operating rule to rules which relate to signaling or communications. The amendments were first suggested in a statement made by Commissioner Splawn, chairman of the com-

mission's legislative committee, before a Senate interstate and foreign commerce subcommittee which is considering S.238 a companion bill to H.R. 378 (see *Railway Age* of July 9, page 135). The amendments, which Commissioner Splawn called "clarifying," were then submitted to the House subcommittee, but no oral presentation on them was made before that group.

The House subcommittee incorporated them into the version of the bill which it decided to report favorably to its parent committee. The report was made at an executive session on July 26, and the result was the aforementioned decision of the parent committee to defer action until it heard a further presentation from the commission. Chairman Crosser said after the committee meeting that the I.C.C.'s further presentation would be heard on August 2; and he assumed that it would include a statement by Commissioner Splawn. He did not know what other members of the commission might appear.

The Federation for Railway Progress this week expressed its opposition to enactment of H.R.378. In a July 27 statement, it attacked the bill as "another in a long series of steps extending government control of the railroads," and charged that such control "has resulted in the decline in less than one generation of the railway industry from a position of progress and prosperity to a struggle for its very existence as a free element of our economy." The announcement also said that F.R.P.'s executive vice-president, Robert M. Drysdale, Jr., had sent to Representative Crosser a letter defending the railroads' safety record as comparing "most favorably with that of any other industry in the land, both as to employees and as to customers."

"The record shows no emergency, no unusual circumstances calling for the further interference of government in the management of this one industry as distinct from all others," Mr. Drysdale added. He went on to assert that the railroads are "in a critical condition," and to warn of an "approaching crisis in railway transportation," which "may be traced to several major factors, not the least of which has been the increasing control of government."

Arguing that "government control really is a primary cause of the railroads' plight," Mr. Drysdale said that this is true because from such control "stem the decline in initiative of management and the growing indifference of labor which have allowed the industry to sink to its present state."

"Why, then," he asked, "this clamor for more of the medicine which has so weakened the patient up to the present?"

Emergency Board on S.P.

President Truman has created an emergency board to investigate a dispute between the Southern Pacific and those of its Pacific Lines' employees who are represented by the Brotherhood of Railroad Trainmen. Issuance of the Presidential order on July 20 resulted in postponement of a strike which the union had called for July 22.

The dispute involves the union's demand for inclusion in its working agreement of "full crew" provisions like those of California's former "full crew" law which was repealed last year (see *Railway Age* of July 23, page 51). Members of the board are R. G. Simmons, F. M. Swacker, and Leverett Edwards. They were scheduled to open hearings at San Francisco, Cal., on August 2.

Hold I.C.C. Hearing in Probe Of New York Egg Damage

The Interstate Commerce Commission held in Chicago on July 26 and 27 the first hearing in connection with its investigation into the increase of loss and damage claim payments by the New York Harbor lines for shipments of shell eggs delivered in New York by rail. The hearing was continuing before Commissioner Mitchell and Examiner Mullen as this issue of *Railway Age* went to press, and will open in New York within a short time.

The proceeding, docketed as No. 30030, was instituted on the commission's own motion with a view to ferreting out reasons for, and obtaining solutions to, egg damage claims at New York which rose from 2,116 claims for 4,552,143 cases received in 1940 to 6,911 claims for 4,568,309 cases in 1947. The dollar amount for claims during this period jumped from $71,652 to $1,505,472, according to the testimony of Edward L. Murphy, special agent for the I.C.C. Commissioner Mitchell said that the egg claim situation in New York "shocks" the commission and that, if the railroads and shippers don't take corrective action, the I.C.C. will.

A principal railroad witness, Walter S. Jensen, manager, Railroad Perishable Inspection Agency, said that the majority of egg damage occurs at the point of origin and not in transit. Contributing factors to the rising cost of claims, he said, are: (1) increased cost of labor used for reconditioning cases which contain damaged eggs; (2) using cases of various types in the same car, and (3) the destination market value of eggs. One of the most important direct causes of damage to shell eggs, he added, is that the egg fits too tightly in the filler, a situation which arises as a result of poultry breeders producing eggs larger than those for which the filler was originally designed.

The Department of Agriculture and various shippers of eggs were also represented at the hearing.

Frisco Receives Coveted Safety Award for 1948 Record

For having raised its safety standing from eleventh to third place among the nation's railroads in 1948, as compared with 1947, the St. Louis-San Francisco has been presented the National Safety Council's "Distinguished Service to Safety Award." The Frisco is the fourth railroad to receive the award since it

Clark Hungerford (left), president of the St. Louis-San Francisco, received for that railroad the National Safety Council's "Distinguished Service to Safety Award," presented by Robert B. Brooks, president of the Greater St. Louis (Mo.) Safety Council, who represented the council

was created in 1942 to promote and encourage safety in all types of industry.

The intensified safety program which earned the honor for the railroad included a series of employee and public safety meetings and the appointment of safety committees among the workers at many points. The Frisco's safety department had been expanded in the latter part of 1947 with the appointment of Roy P. Hamilton as safety superintendent and the designation of safety supervisors at various points throughout the system.

Passes on Mileage Rate For Cars of Non-Shipper

Reporting on further hearing in the No. 29542 proceeding, the Interstate Commerce Commission has found "reasonable" the mileage rate of 1.25 cents paid by the railroads for use of the Keith Railway Equipment Company's tank cars during the period from August 15, 1943, to November 1, 1945. This is the case wherein the commission's prior report by Division 3 found that changes made by the Transportation Act of 1940 in the Interstate Commerce Act's section 1(14) (a) had the effect of giving the commission authority to determine the compensation to be paid by railroads for the use of freight cars owned by non-shippers.

As noted in the *Railway Age* of August 9, 1947, page 76, where Division 3's decision was reported, Keith, a non-shipper, protested against a reduction in the mileage rate from 1.5 cents to 1.25 cents. Its complaint, directed against the Association of American Railroads and that organization's member roads, was first filed in the United States District Court for the Northern District of Illinois. The court directed the complainant to obtain a commission determination, and Keith then filed a complaint with the commission. Its original prosecution of that complaint, however, was confined to evidence in support of its contention that the commission lacked jurisdiction in the matter.

After Division 3 had claimed jurisdiction, the commission assigned the proceeding for further hearing on the matter of the reasonableness of the assailed mileage rate. The present commission report dismissed the complaint after finding that the assailed rate had been "reasonable," as noted above. Before reaching that determination, however, the commission passed on another jurisdictional question raised by the complainant, i.e., a contention that in any event the commission's authority over rentals paid for cars of non-shippers does not extend beyond the power to fix the maximum amount of such rentals that the railroads might claim as an operating expense for rate-making purposes. The commission rejected the contention, saying that legislative history of the 1940 act made it "plain" that the intent of Congress was to confer upon the commission "the power to fix the specific or exact compensation which may be paid to the car owner."

The report then proceeded to dispose of the question as to whether the authority thus conferred included power to fix the rentals for any period in the past. The commission found that it did. It based the finding on an examination of pertinent provisions of the act which led it to the general conclusion that its authority as to car service "is no different in its effect than that . . . as to freight rates or passenger fares."

Commissioner Alldredge filed a separate opinion which he called "dissenting," although he concurred in the majority's finding that the assailed mileage rate had been "reasonable." Mr. Alldredge's objection was to assumption of jurisdiction, which he does not think the commission possesses, to pass upon the reasonableness or unreasonableness of car rentals in the past. The same view was expressed by Mr. Alldredge in the "concurring-in-part" opinion which he filed with the commission's recent decision that dismissed the so-called per diem complaints (see *Railway Age* of July 23, page 43).

R. B. A. Explains Intervention In Reparations Cases

"No other industry in the United States has a greater interest than that represented by the Railway Business Association" in the outcome of the so-called reparations cases filed against the railroads by the Department of Justice, P. Harvey Middleton, R. B. A. president, has declared in a special statement to the association's members explaining why it has intervened before the Interstate Commerce Commission in opposition to the department's claims.

"The continuation of private enterprise in this country may well depend upon the final decision in these proceedings," the statement says, adding that they would, if successful, "deprive the railways of substantially all the net income they earned during the war." The statement further points out that "if the rates charged on war traffic had been unreasonably high, obviously the railways would have had a much higher rate of return" than the 4.6 per cent on net investment which they actually earned during the 1941-1946 period for which reparations are being sought.

"Because the internal revenue laws will not permit the railways to recover any of the taxes paid by them during the war, if the government is successful in these suits, the railways would be in the position of having paid high taxes on their net income and then having the government take that net income away. This would in effect be double recovery to the extent of those taxes." Railway federal income taxes alone during the war period totaled more than $3.8 billion, the statement says, the rates in many cases being as high as 85.5 per cent.

"The railways made very few charges to the government that were not appreciably lower than the rates available to other shippers," the statement declares, and "made no charges that were not agreed upon as fair by representatives of the government at the time the shipments were made."

"If the Department of Justice should be awarded anything like the huge amount (more than $2 billion) it has estimated as recoverable, it would have to be paid either out of the assets of the railways or out of future earnings. In either event, there would be an immediate halt in the billion-dollar-a-year railway modernization and improvement program, so essential to efficient handling of peacetime traffic and to preparedness for any future war.

" . . . the railways . . . have no large cash reserves available. An increase in freight rates sufficient to meet the demands of the Department of Justice would have a disastrous effect upon our national economy.

"Such a chaotic situation might develop that we would be brought to the verge of nationalization of our rail lines. If that should happen, the government would soon find it necessary to nationalize also the common carriers on the highways, waterways, and airways. Government ownership of other basic industries would follow in short order. Individual incentive would be replaced by a planned economy. Socialism would 'take over.'

"If anyone thinks that if the railways were owned by the government they would serve him as efficiently and economically as under private ownership, he should look into the record of government ownership and operation of railways in other countries. . . . Under any system of nationalization, commercial principles are subordinated to political and bureaucratic considerations."

The R. B. A's petition to the I. C. C. for leave to intervene in the reparations cases was reported in the *Railway Age* of July 9, page 166, while commission approval of that petition is noted elsewhere in this issue. Other interveners, all opposing the department's claims, include the Railway Labor Executives' Association and standard railway labor organizations, the National Industrial Traffic League, the Railroad Security Owners' Association and the Transportation Association of America.

P.E.I. Proposes Amalgamation-Nationalization in Canada

A suggested "solution" to Canada's railroad problems through amalgamation of its railways under government ownership has been submitted by the provincial government of Prince Edward Island to the Royal Commission on Transportation which is making a country-wide investigation of Canada's transportation difficulties.

Declaring the railway problem must be solved quickly, the provincial government said that, unless some other means is found to provide adequate national

service without rising freight rates, amalgamation-nationalization is the only alternative solution. The proposal was set out in a 60,000-word brief presented to the commission and backed by a personal statement from P.E.I. Premier J. Walter Jones.

The P.E.I. government took hold of the politically touchy amalgamation issue more firmly than any other body to appear before the commission since the three-man group opened its Canada-wide tour seven weeks ago. Saying Canada needs a national policy on transportation, it added flatly that amalgamation under government ownership provides such a policy. The government added specifically that amalgamation would involve taking over the Canadian Pacific, Canada's $1,300,000,000 private rail corporation, and the elimination of competition.

Smith Warns Northwest Board Against Government Ownership

The Northwest Shippers Advisory Board, meeting at Great Falls, Mont., on July 28, was warned against the dangers of government ownership and operation of railroads, and was told by Earl B. Smith, of Minneapolis, Minn., vice-president and director of traffic of General Mills, Inc., that Congress should adopt a policy that would treat all forms of commercial transportation alike.

"The service performed by our railroads," Mr. Smith declared, "is a basic function in our whole society—so much so that if it is not or cannot be provided by private enterprise, then it will be provided by government." Government ownership, he maintained, would lead to government control not only of all other agencies of transportation, but also all basic industries.

Such control of the railroads, Mr. Smith continued, would mean the political dictation of rates for the transportation of freight and passengers, the elimination of on-line purchases by railroads in the territories they serve, and the addition of an enormous number of voters to the federal payroll. It would also result in the total loss of the millions of dollars which the railroads pay in taxes to federal, state and municipal governments, and would produce inefficiency in operation and huge deficits for the taxpayers to make up, he added. In addition, government operation of railroads would bring about "the wholesale destruction of incentive—the abandonment of such fundamental qualities of character as self-reliance, resourcefulness, ingenuity and the will to succeed despite all obstacles."

Mr. Smith contended that the United States should profit from Great Britain's experience in nationalizing its industries, and not permit the same sort of thing to happen in this country. The only way to insure continued private operation of the railroads, he said, is to enable the carriers to make earnings that will attract private capital. At present, he stated, the railroads are in a precarious position financially, and find it difficult to obtain private funds for improvement of their equipment and services.

Mr. Smith pointed out that "failure to solve our transportation problem in the proper way, and in due time, could affect no one group in this country as much and as long as it would affect the users of transportation."

Freight Car Loadings

Loadings of revenue freight in the week ended July 23 totaled 718,516 cars, the Association of American Railroads announced on July 28. This was a decrease of 5,584 cars, or 0.8 per cent, under the previous week, a decline of 163,613 cars, or 18.5 per cent, under the corresponding week last year, and a drop of 201,412 cars, or 21.9 per cent, below the equivalent 1947 week.

Loadings of revenue freight for the week ended July 16 totaled 724,100 cars, and the summary for that week as compiled by the Car Service Division, A.A.R., follows:

REVENUE FREIGHT CAR LOADINGS
For the week ended Saturday, July 16

District	1949	1948	1947
Eastern	128,363	151,434	158,428
Allegheny	138,974	181,742	195,159
Pocahontas	42,099	75,231	67,358
Southern	102,815	131,460	130,365
Northwestern	134,564	138,354	145,594
Central Western	120,553	142,032	149,005
Southwestern	56,732	71,827	73,826
Total Western Districts	311,849	352,213	368,425
Total All Roads	724,100	892,080	919,735
Commodities:			
Grain and grain products	79,746	66,941	71,933
Livestock	8,909	10,218	13,019
Coal	100,202	195,811	181,264
Coke	8,466	12,966	13,780
Forest products	35,799	51,851	49,563
Ore	83,896	83,822	90,982
Merchandise l.c.l.	85,002	97,457	110,234
Miscellaneous	322,080	373,014	388,960
July 16	724,100	892,080	919,735
July 9	595,321	755,100	807,117
July 2	644,182	757,278	629,204
June 25	802,941	888,368	846,141
June 18	649,351	906,631	901,296
Cumulative total 28 weeks	20,055,401	22,474,690	23,338,225

In Canada.—Carloadings for the week ended July 16 totaled 73,181 cars, as compared with 72,936 cars for the previous week, and 77,729 cars for the corresponding week last year, according to the compilation of the Dominion Bureau of Statistics.

	Revenue Cars Loaded	Total Cars Rec'd from Connections
Totals for Canada:		
July 16, 1949	73,181	28,344
July 17, 1948	77,729	30,118
Cumulative totals for Canada:		
July 16, 1949	2,021,824	872,406
July 17, 1948	2,088,592	975,655

T. A. A. Organizes Northern California-Nevada Forum

"The nation's transportation problem must be solved under the principle of competitive private ownership within the next few years or state socialism will be inevitable in the United States," Donald D. Conn, executive vice-president of the Transportation Association of America, declared at the organization luncheon of the association's Northern California-Nevada forum at San Francisco, Cal., on July 21.

The forum—of which Ray B. Wiser, of Berkeley, Cal., president of the California Farm Bureau Federation, and a director of T.A.A., is chairman—is one of 21 such groups to cover the entire country—each composed of leaders of agriculture, industry, finance and transportation. Within each forum area, "private enterprise committees" are being organized in principal towns and cities.

"During the past 20 years," Mr. Conn also said, "we have witnessed a country racked by depression and disaster—arrayed against itself by class action—with its institutions slowly crumbling because self-interest in enterprise and political dishonesty in government have been asserted to a degree wholly incompatible with the welfare of the entire nation.

"Fundamentally the United States is strong, even though it is impregnated with socialism. The enterprise system is a proven doctrine for the best living. What it lacks is a real and sincere purpose among its leaders—a willingness to meet the great moral issues which underlie the economic and political issues.

"Every community has its leftist leaders. Little 'cells' of opinion can be activated into a sweeping national demand for still greater centralization in government unless leaders of enterprise deal with basic issues from an economic standpoint and through consistent programs of education—rather than rely upon political activity just in advance of each national election. To meet this great need the regional forums and the private enterprise committees are being established in all areas and principal towns of the country.

"During the past three decades government has moved steadily into the field of American economy. Since 1920 the total investment of all public funds in the capital structure of the nation has exceeded $75 billion, of which $53 billion has been expended upon transportation. The problem which confronts the association with its forums is to make the system of private ownership work when superimposed upon this mixture of government and private capital.

"The system of 'free enterprise' as we knew it 25 years ago is gone forever. There is nothing 'free' about any of our enterprise in the present-day economy. We cannot retrace our steps to a straight-out, self-contained basis for every segment of business. Our task on the broad economic and political front is to preserve and strengthen what we have left—or sink into socialism of the British pattern.

"To deal with the serious dislocations in transportation the association has established the National Cooperative Project. With its panels and legal advisory group representing all elements of business, and all forms of transportation, the issues of the problem are being resolved through research and informal negotiation.

"The regional forums will implement

an intensive and continuous educational program on the transportation problem. They will substitute an economic and public interest approach for the manipulations of pressure groups and politicians. They will study the issues of the problem from the standpoint of the transportation requirements of their areas and assist in drafting new national policies and a modern system of federal regulation.

"There is no justifiable economic reason for the dilemma of transportation. The problem is man-made. It must be solved through cooperative action by the leaders of enterprise before government ownership becomes the only recourse for the public interest.

"If transportation is nationalized the enterprise system will topple like a house of cards."

New York Commutation Fare Tariff Suspended

The Interstate Commerce Commission has suspended, from July 22 to and including February 21, 1950, the operation of a New Jersey & New York tariff whereby that road proposes to increase commutation fares between New York and stations on its line in New Jersey by amounts ranging from approximately 31 to 42 per cent.

Lets R. B. A. Intervene In Reparations Cases

The Interstate Commerce Commission has authorized the Railway Business Association to intervene in the 17 pending proceedings which involve the federal government's claims for reparations on railroad rates paid for its shipments of various commodities during World War II. The intervention was opposed by the Department of Justice, the R.B.A. petition having stated the association's purpose to support the railroads' position in the proceedings.

Elsewhere in this issue is a summary of a special statement recently sent to members of the R.B.A. by its president, P. Harvey Middleton, explaining the reasons for the association's intervention.

Kendall Receives Honorary Degree from Dartmouth

Warren C. Kendall, retired chairman of the Car Service Division of the Association of American Railroads, was recently awarded an honorary master of arts degree by Dartmouth College, from which he was graduated 50 years ago. The citation accompanying the degree read in part as follows:

"When the name of a railroad station is changed from Pompanoosuc to Kendall to honor a man who was born in that station, it is safe to assume that the man is both a Vermonter and a railroader born and bred. . . . Your life work in American railroading is a study in public service through private effort. In the crisis of war, you perhaps more than any other individual fashioned the triumph of American rail transport without which there could have been no victory. . . ."

J. V. B. Duer Awarded Medal By Franklin Institute

John Van Buren Duer, who retired in 1947 as assistant to vice-president, operation, of the Pennsylvania, has been awarded the George R. Henderson Medal of the Franklin Institute "for his resourcefulness and contributions in the coordination of railroad engineering matters, especially in the electrification of the Pennsylvania," it was announced this week by Dr. Henry B. Allen, executive vice-president and secretary of the institute. The medal will be presented to Mr. Duer by Richard T. Nalle, president of the institute, at ceremonies in Philadelphia, Pa., on October 19.

OVERSEAS

John Aiton Kay

As reported in the *Railway Age* of July 23, page 52, John Aiton Kay, editor since 1910 of the Railway Gazette, London, England, and deputy chairman and managing director of Transport (1910) Limited, the company which owns and publishes Railway Gazette, died on July 8, at the age of 67.

Educated at Mill Hill School, Mr. Kay entered the publishing field in 1898, with the firm of George Newnes, where he had charge of the model engineering section of The Captain, a boys' periodical. In 1902 he became assistant editor of Transport, a weekly paper established in 1892, which was the direct predecessor of the present Railway Gazette. In 1904 this publication was reorganized and its control was assumed by the publishers of *Railway Age* in the United States; the name of Transport was changed in that same year to Transport & Railroad Gazette, with the present name, Railway Gazette, being finally adopted in 1905.

In 1910, Mr. Kay was instrumental in bringing about the separation of *Railway Age* and Railway Gazette, and in returning the latter publication to British control through the formation of a new company, Transport (1910) Limited, of which he became managing director and secretary, in addition to assuming the editorial direction of Railway Gazette.

During the next decade the Railway Gazette absorbed a number of other British railway publications, including the Railway Times, the Railway News, the Railway Engineer and the Railway Magazine. In 1919 Transport (1910) Limited also acquired control of the Directory Publishing Company, which owned the Universal Directory of Railway Officials and a similar directory in the shipping industry. At various dates since 1910, Mr. Kay's company also has established a number of additional publications covering basic industries, such as coal mining, chemistry, building, food and water power, and a monthly publication on Diesel Railway Traction.

Mr. Kay himself assumed the chairmanship of Transport (1910) Limited in 1931, a position which he coupled with that of managing director until September, 1945, when control of the company passed to Odhams Press Limited, at which time he became deputy chairman and managing director. He held those positions, and likewise the active editorial direction of Railway Gazette, up to the time of his death.

Mr. Kay was one of the founders, and chairman, of the London Transportation Club, which was originally established by the British railways during World War II to provide a meeting place for American, Canadian and British railway officers, and which, as reconstituted after the war, has a membership of over 500

John Aiton Kay

senior executives representing all types of transportation both in Great Britain and other countries.

Mr. Kay's connection with British railroading, which began at a time when there were over 100 individual railway companies in Great Britain, continued through the 1923 consolidation of those lines into four major companies, and on into the post-World War II nationalization. Hs was, the Railway Gazette commented editorially, "never fully convinced of the wisdom of railway grouping as effected by the Railways Act, 1921. Many of the criticisms and forebodings of that plan which he voiced at the time were justified later by events. He believed in the small unit with individuality. To him a railway was a living thing, and the tendency towards ever larger and more impersonal organizations, with greater remoteness of control, did not appeal to him."

"Kay believed strongly," the editorial continued, "in private enterprise as the basis of transport in this country. Bureaucracy in any form was abhorrent

to him. Essentially an individualist, he did not accept all the arguments advanced in favor of standardization or nationalization. He did not consider the nationalization of British railways as good either for transport or the country, and he did not hesitate to say so. . . ."

SUPPLY TRADE

Pressed Steel Net Was $1,526,881 in First Half

Consolidated net earnings of the Pressed Steel Car Company for the six months ended June 30 totaled $1,526,881, compared with a net loss of $666,493 for the first half of 1948, according to a report recently issued to the firm's stockholders. Sales during the first half of 1949 amounted to $32,103,197, compared with $31,110,952 during the first six months of last year. The substantial improvement in net results, on the relatively small increase in sales, "is perhaps the best indication of the effect operating economies, increased efficiency and adequate controls have had on your company's operations," John I. Snyder, Jr., president and chairman, said in a letter accompanying the report.

Pressed Steel Car, along with the industry generally, Mr. Snyder said, finds itself with a rapidly declining backlog of orders for freight cars. The McKees Rocks plant, Pittsburgh, Pa., is now partly shut down, and, if no additional freight-car orders are received, will be completely shut down late in September. The plant probably will operate at a profit until a complete shut-down occurs, Mr. Snyder added. Although the Mt. Vernon, Ill., plant is still operating at a high rate of car production and profit, a shut-down is scheduled there by the middle of August. "As a result of a relatively economical shut-down plan for both carbuilding plants," Mr. Snyder said, "and based on a continuance of profitable operations for the balance of the year in the export division and in your Philippine subsidiary, and assuming that we receive no further domestic freight car orders for the balance of the year, we believe that there will be no serious impairment up to the year-end of our earnings so far recorded."

John R. Kingman, formerly assistant manager of sales, railway division, of the **National Malleable & Steel Castings Co.,** has been promoted to sales manager of the division, at Richmond, Va., succeeding **William Blackmore,** who has retired after 43 years of service.

The **L. B. Foster Company,** Pittsburgh, Pa., recently opened a new $150,000 plant at Houston, Tex. The plant has complete facilities to handle steel rails and steel products on a 12-acre site in the Burchfield industrial district of Houston.

Watson P. Hall, for the past three years a member of the service engineering staff of the **American Wheelabrator & Equipment Corp.,** Mishawaka, Ind., has been transferred to the firm's sales office at Toronto, Ont.

The **Superior Hand Brake Company,** Chicago, has moved its offices from the Railway Exchange building, 80 East Jackson boulevard, to the Peoples Gas building, 122 South Michigan avenue.

The **Union Railway Equipment Company,** Chicago, has appointed **Walter M. Gibbs,** of the **W. M. Gibbs Railway Supply Company,** 332 South Michigan avenue, Chicago, as its exclusive sales representative for "Ureco" devices in the Chicago territory and west to Salt Lake City, Utah; south through Texas, and east through Indiana.

OBITUARY

Edward J. Burnell, vice-president and general sales manager of the Link-Belt Company, Chicago, died at his home in Winnetka, Ill., on July 22.

Franklin L. Whitcomb, who retired in 1937 as president of the Griffin Wheel Company, Chicago, died on July 26 at his summer home in Cotuit, Mass., at the age of 87.

ORGANIZATIONS

Three I.C. Commissioners Will Speak at Short Lines' Meeting

Interstate Commerce Commissioners William J. Patterson, Richard F. Mitchell, and Hugh W. Cross will be speakers at the thirty-sixth annual meeting of the American Short Line Railroad Association which will be held September 27 and 28 at the Morrison Hotel, Chicago. This was announced by the association's president, J. M. Hood, in a recent notice which also said that other addresses will be delivered at the meeting by L. W. Horning, vice-president, New York Central; H. W. Fraser, chairman, Railway Labor Executives' Association; E. H. Davidson, director, Bureau of Locomotive Inspection, I.C.C.; E. Grover Plowman, vice-president—traffic, United States Steel Corporation; George W. Harris, safety consultant, National Safety Council, and Kenneth F. Burgess, chief counsel for the railroads in the so-called reparations cases which arose out of the Department of Justice's attacks on charges paid by the federal government for railroad service during World War II.

Other proceedings of the meeting will include reports of the association's officers and standing committees. The latter will deal with accounting, car service, legislation, developments of interest to mechanical officers, operations, traffic, mail pay and express, and freight claim rules. At election sessions, the association's members will choose its board of directors and officers for next year, while members of regional groups will elect the regional vice-presidents. John W. Barriger, president of the Chicago, Indianapolis & Louisville, is chairman of the committee on arrangements for the meeting.

EQUIPMENT AND SUPPLIES

SIGNALING

The **Chicago, Milwaukee, St. Paul & Pacific** has ordered from the Union Switch & Signal Co. material to install automatic permissive block signaling on approximately 41 mi. of single-track line between Janesville, Wis., and Madison, involving searchlight signals, relays, switch circuit controllers, rectifiers, transformers and housings. The field work will be handled by railroad forces.

FREIGHT CARS

The General American Transportation Corporation has received an order for 100 aluminum tank cars from the **Solvay Process Company.** The order—said to be the largest ever placed for that type of car—calls for the cars to be fabricated of heavy aluminum plate with stainless steel fittings.

CONSTRUCTION

Chicago, Rock Island & Pacific.—This road has awarded a contract to Efriam Anderson, Chicago, for repairing and remodeling its passenger station and platforms at Peoria, Ill., at an estimated cost of $40,000. The Bell Construction Company, Davenport, Iowa, is performing work on bridge No. 805 over the Cache river at Brasfield, Ark, involving the replacement of timber pile piers with reinforced concrete piers on foundation piling, at an estimated cost of $40,000.

Western Pacific.—This road has applied to the Interstate Commerce Commission for authority to construct in Marysville, Cal., a 2,694-ft. extension of its line which would provide a connection with the Southern Pacific for interchange of traffic. The proposed track, costing about $35,913, would continue interchange arrangements heretofore provided by an S. P. track which

the commission recently authorized that road to abandon because it was in the way of a proposed state highway (see *Railway Age* of June 4, page 59). Because the S. P. had other interchange points at which the interline traffic could be handled, the commission refused to grant requests of protesting interveners, including the W. P., that the S. P. be required to construct a substitute track at Marysville. The report did say, however, that if the W. P. "is of the view that substitute interchange . . . should be provided at Marysville, it may file an appropriate application." In addition to its request for authority to construct the proposed connection, the application seeks authority for operation over the new track by the W. P. and its lessor, the Sacramento Northern.

FINANCIAL

Way Cleared for Independence Of Atlantic & Danville

Four July 20 reports by Division 4 of the Interstate Commerce Commission cleared the way for independent operation of the Atlantic & Danville, which has been a lessor line of the Southern system since 1899. One of the reports authorized the A. & D. to carry out its plan for modifying some of its securities under the provisions of the so-called Mahaffie Act, now section 20b of the Interstate Commerce Act, while another provided that, when this financial readjustment plan has been consummated, the Southern may exercise the authority it received previously on a deferred basis to abandon operation of A. & D. properties. The other two reports authorize the acquisition by the A. & D. of trackage rights over lines of the Atlantic Coast Line and Richmond & Mecklenburg.

The A. & D.'s plan for modification of its financial structure was outlined in the *Railway Age* of April 9, page 72, where it was noted that Division 4 had authorized submission of the plan to interested security holders. The first July 20 report listed above is a supplemental report in that proceeding, which is Finance Docket No. 16171; it makes the necessary finding that the proposed modifications have been assented to by holders of at least 75 per cent of each class of securities involved. It also provides that the revamp plan shall be effective as of July 1.

The report which paved the way for exercise by the Southern of its authority to abandon operation of A. & D. properties was a supplemental report in Finance Docket No. 16000. Among other things, it provided for submission to the commission of any agreement between the Southern and the A. & D. with respect to a settlement for the period of Southern operation beyond July 1, the date on which its lease expired.

The approved trackage-rights arrangements with the A. C. L. will give the A. & D. joint use of the former's Pinners Point, Va., terminals and facilities and of its tracks extending from such terminals to a connection with the A. & D. at Boone, Va., 7.8 mi. The approved arrangements with the R. & M. cover use by the A. & D. of that road's 1.8-mi. line between Jeffress, Va., and Clarksville Junction. This R. & M. line is the only connection between the two segments of line which comprise the A. & D.'s 203.2-mi. system. One segment extends 140.5 mi. from West Norfolk, Va., to Jeffress, and the other extends 62.7 mi. from Clarksville Junction, Va., through a portion of North Carolina to Danville, Va. The trackage-rights cases were Finance Docket Nos. 16596 and 16597. (See *Railway Age* of June 18, page 71).

The A. & D.'s financial and operating plans were outlined in a special press announcement issued on July 22 by its president, E. L. Keister, from the road's offices at 115 West Tazewell street, Norfolk 10, Va.

"We are preparing," this statement said, "to accept re-delivery of the property from Southern Railway Company and commence business as of midnight July 31. Our new through freight service, on an overnight schedule between Norfolk and Danville, will begin operating in each direction on August 1, but there will be no more passenger service over the line as of that date.

"The New York banks which have heretofore been the trustees under our first and second mortgages (Bankers Trust Company and Chase National Bank, respectively) are resigning and will be succeeded by the National Bank of Commerce of Norfolk as successor trustee under a supplemental first mortgage and the Seaboard Citizens National Bank of Norfolk as successor trustee under a supplemental second mortgage. Additionally, the National Bank of Commerce will act as depositary and exchange agent in connection with the exchange of bonds. We expect . . . that the actual exchange of old bonds for new will begin on August 15 . . .

"Under the plan, a first mortgage bond will be exchanged for $440 in cash on account of principal and interest, a certificate for two shares of common stock without par value, and a new $600 bond bearing interest at 3 per cent, which interest will be payable out of earnings during the first five years of operation. A second mortgage bond will be exchanged for $290 in cash on account of principal and interest, a certificate for one share of similar stock, and a new second mortgage bond for $750 with the same rate and conditions as to interest.

"Compromise of the litigation with the Southern will be consummated before the end of the month by a payment of $3,000,000. Of this sum A. & D. will devote about two-thirds towards reduction of its mortgage debt and the remaining one-third for other corporate purposes. We will thus have less than $3,500,000 in bonds outstanding, annual charges for which at 3 per cent amount to $104,962.50.

"A. & D. will own about 170 freight cars at the start. After making cash payments aggregating almost $300,000 on account for the purchase of six new 1,500-h.p. Diesel-electric locomotives—delivery of which will commence the first week in August—the company will have about half a million dollars in cash for working capital to meet the contingencies of what is virtually a new railroad enterprise. . . . While small, the company intends to take its rightful place in competition with other roads and press firmly towards the building up of a business which will be distinctly in the public interest."

I.C.C. Approves Nickel Plate Lease of Wheeling & Lake Erie

Division 4 of the Interstate Commerce Commission has approved the New York, Chicago & St. Louis' plan to lease the properties of the Wheeling & Lake Erie. The Nickel Plate is now the controlling stockholder in Wheeling, having built its holdings to 79.35 per cent of the voting shares pursuant to authorizations received from the commission over the past two years.

The commission's approval of the lease was embodied in a July 21 report in Finance Docket No. 16308; and it was made subject to several conditions, including one which will require the Nickel Plate to set aside funds each year for purchase of minority holdings of Wheeling stock. The condition is a modified version of one suggested by interveners, including the Pennroad Corporation which has the largest minority holding (59,500 shares) in Wheeling.

The lease will be for 99 years, renewable for like terms perpetually. In addition to properties of the W. & L. E. proper, it will embrace properties of that road's subsidiaries—the Loraine & West Virginia, the Toledo Belt, and the Zanesville Belt & Terminal. The leased properties will be "integrated" into the Nickel Plate system and all operations "will be performed in the name of and by the latter," the commission's report said.

As to rent, the Nickel Plate will assume liability for all Wheeling obligations and also pay quarterly $1 per share on the Wheeling's prior lien stock and $1.4375 per share on its common—except that no payment will be made with respect to any Wheeling shares owned by the Nickel Plate. On an annual basis, these payments will be equivalent to dividends on the stock of $4 and $5.75 per share respectively; the annual total will be $539,960, including $2,680 on the prior-lien stock and $537,280 on the common.

Other provisions of the lease stipulate that the Nickel Plate will provide such funds as may be necessary to preserve the Wheeling's corporate existence; pay all taxes assessed against the Wheeling properties or income therefrom; and

provide for the leased properties "reasonable" depreciation and amortization allowances, which, however, will be limited "to the amount allowed for federal income tax purposes." Also, there are provisions relating to capital expenditures on the leased properties, accounting, and return of the leased properties if the lease should be terminated.

As to these provisions of the lease which call for the assumption by the Nickel Plate of Wheeling obligations, the commission granted the necessary authority under the Interstate Commerce Act's section 20(a). These obligations include $6,870,000 of the Wheeling's first-consolidated-mortgage 4 per cent bonds; $5,811,000 of its general and refunding mortgage 2¾ per cent bonds; $18,930,000 of its equipment trust certificates; and $6,645,800 of its promissory notes. Also, there are sinking fund obligations to be assumed in connection with some of the bonds. The commission ruled that the Nickel Plate needed no section 20(a) authority to make the cash rental payments on Wheeling stock, and thus dismissed that phase of the application which sough such authority. The findings under section 5(2) in connection with the approval of the lease were all that was required to authorize the payments on the stock, the report explained.

The Nickel Plate now operates 1,687 miles of road with lines extending from Buffalo, N. Y., westerly through Cleveland, Ohio, Fostoria, and Fort Wayne, Ind., to Chicago; from Toledo, Ohio, southwesterly through Continental, Ohio, and Delphos to Kokomo, Ind., and Frankfort, and thence to St. Louis, Mo.; from Sandusky, Ohio, westerly through Fostoria to Muncie, Ind., and thence through Frankfort and Lafayette, Ind., to Peoria, Ill.; from Michigan City, Ind., southerly through Kokomo to Indianapolis; from Fort Wayne southerly through Muncie to Rushville, Ind., and Connersville; and from St. Marys, Ohio, to Minster. The Wheeling operates 505 miles of road, all in Ohio. Its lines extend generally from Toledo, Huron and Cleveland in an easterly and southerly direction to Steubenville, Martins Ferry (on the Ohio river opposite Wheeling, W. Va.), and Zanesville. Operations between Linndale, Ohio, and Wellington, 32 miles, are conducted under trackage rights over a New York Central line, and that arrangement will be continued by the Nickel Plate.

Discussion in the report indicated that the commission viewed the lease as "a sequel to preliminary steps toward unification of the Wheeling and Nickel Plate previously authorized by us in the control cases." The report went on to recall that in those cases the commission "found, in effect, that unified operation of the two lines wa desirable in that a stronger transportation unit would be created thereby because the lines were naturally complementary and not competitive . . ." The record in the present case "warrants similar findings," the commission added. Previously, it had reviewed evidence to the effect that a merger or consolidation of the properties could not be arranged at this time, principally because of problems related to accumulated dividends on the Nickel Plate's preferred stock. A consolidation or merger plan "might conceivably be preferable" to the lease proposal, the commission conceded, but it was convinced from the record that no such plan could be presented "at any reasonable time in the future." The minority stockholders of Wheeling share that view, the report added.

The condition requiring the Nickel Plate to set aside funds for purchase of these minority holdings stipulates that the lessee, after making provision for the payment of the current annual dividend on its own preferred stock and not more than $12 annually on the accumulated dividends thereon, and after providing for sinking funds, shall set aside annually 15 per cent of the net income remaining, or $200,000, whichever is less, to be used as a purchase fund to be applied first to the purchase of Wheeling common stock at a price no exceeding par, and secondly to the retirement of any Nickel Plate obligations, including Wheeling common stock, at prices considered by the management to be advantageous.

"Under this plan," the commission said, "the minority stockholders will not be required to assume any obligation to sell their stock to the Nickel Plate but will, in normal times, have a market for $200,000 worth of it annually, at not to exceed par. This, we think, is all that they may reasonably ask. If they see fit not to tender their stock at this price the fund will be used for other debt reduction and a consequent strengthening of the Nickel Plate financial structure."

Another condition will require the Nickel Plate, "so far as within its power," to maintain and keep open "all existing rates, routes, and channels of trade via existing junctions and gateways unless and until otherwise ordered by this commission." Eight specific conditions along that line were sought by the Akron, Canton & Youngstown, but the commission decided that assurance to which that intervener was entitled would be afforded by the general condition set out above and a supplemental requirement that the Nickel Plate serve on the Youngstown, before or at the time of filing with the commission, any of its future routing guides affecting the movement of traffic over the line of the Youngstown.

Nickel Plate and Wheeling employees represented by union parties to the so-called Washington Job Protection Agreement of 1936 will be protected by that agreement, the commission noted. It then went on to prescribe conditions for the protection of unrepresented employees who might be adversely affected by the lease. Meanwhile, it had denied motions filed by a Nickel Plate preferred stockholder who sought to have the proceeding dismissed. The order accompanying the report will become effective 40 days after its date, which was July 21.

Central of New Jersey.—*Modification of Securities.*—The Interstate Commerce Commission has authorized this road to carry out its plan for modifying its general mortgage bonds and common stock under provisions of the so-called Mahaffie Act (section 20b of the Interstate Commerce Act). The plan involved is the amended proposal submitted to the commission when it became apparent that holders of a "substantial number" of shares of the affected common stock were unwilling t assent to the original plan which was approved by the commission in a previous report (see *Railway Age* of June 11, page 62, and June 25, page 112). The proceeding is Finance Docket No. 16211, and the commission's present report fixes July 1 as the effective date of the plan and makes the required finding that the proposed modifications have been assented to by holders of at least 75 per cent of each class of securities involved.

Chicago Great Western. — *Trackage Rights.*—This road has applied to the Interstate Commerce Commission for authority to amend a 1929 agreement under which it uses 0.4-mi. of the Union Pacific line; the Chicago, Burlington & Quincy's passenger station; and about 2 mi. of the latter's track, all in Omaha, Neb.

Missouri-Kansas-Texas.—*Bond Modification.*—This road has pplied to the Interstate Commerce Commission for approval of a plan to fund the unpaid interest accumulations on its series A, 5 per cent, adjustment mortgage bonds. The plan would be carried out under provisions of the so-called Mahaffie Act which is now section 20b of the Interstate Commerce Act. The bonds involved are outstanding in the amount of $13,555,864; and on January 1, 1950, the unpaid interest will amount to $350 per $1,000 bond—a total of $4,744,553. The funding plan proposes a $4,744,553 issue of secured debenture bonds to be distributed to the adjustment-mortgage bondholders in exchange for their unpaid interest coupons. The new debentures, dated January 1, 1950, would mature January 1, 1967; but they would be callable and their indenture would include sinking-fund provisions. They would bear interest at 1 per cent, which would be cumulative up to 4 per cent of their face amount. In proposing the plan, the M-K-T said that the interest accumulations could not be paid in cash "without the diversion of funds urgently required for purchase of equipment, improvements, expanding facilities, and meeting maturing installments of bank loans and equipment obligations."

Ogden Union Railway & Depot.—*Operating Agreement.*—Division 4 of the Interstate Commerce Commission has

authorized this company and its proprietary roads, the Union Pacific and Southern Pacific, together with their respective subsidiaries, the Oregon Short Line and Central Pacific, to modify a 1920 agreement covering operation of the Depot Company's facilities at Ogden, Utah. The amended agreement is designed to readjust the proprietary roads' proportionate shares of the Depot Company's expenses and thus cure what they regard as inequities resulting from the application of the original agreement to changed conditions in the terminal area. On the basis of figures for July, 1948, which the parties said were "representative of a normal month," the commission calculated that the amended agreement would cut the U.P.'s proportionate payment toward the Depot Company's operating expenses from 67 per cent of such expenses to 62 per cent, while the S.P.'s share would go up from 33 per cent to 38 per cent. Also involved are changes in the trackage operated and maintained by the Depot Company, and corresponding modifications in the rentals for such trackage. Except for one clause, which provides for adjustment of part of the U.P.'s payments for the period from August 23, 1947, to May 1, 1948, the amended agreement applies retroactively to the latter date.

Pennsylvania. — *Lease Modifications.*— This road has applied to the Interstate Commerce Commission for authority to modify leases between it and 22 lessor railroad companies to provide for current accounting on and after January 1, 1949, with respect to depreciation, amortization and retirements (see *Railway Age* of June 25, page 112).

The 22 separate applications related to the following lessor companies: Belvidere Delaware; Connecting; Cumberland Valley & Martinsburg; Delaware River & Bridge; Englewood Connecting; Grand Rapids & Indiana; Indianapolis & Frankfort; Louisville Bridge & Terminal; New York Bay; New York, Philadelphia & Norfolk; Ohio Connecting; Pennsylvania, Ohio & Detroit; Pennsylvania Tunnel & Terminal; Perth Amboy & Woodbridge; Philadelphia, Baltimore & Washington; Pittsburgh, Cincinnati, Chicago & St. Louis; Pittsburgh, Ohio Valley & Cincinnati; South Chicago & Southern; Terre Haute & Peoria; Union of Baltimore; Western New York & Pennsylvania and Wheeling Terminal.

Pennsylvania.—*Participation in Ownership of I.N.*—The Interstate Commerce Commission has authorized this road and its parent, the Pennsylvania Company, to become joint applicants for permission to participate, with the Atchison, Topeka & Santa Fe and the Chicago, Burlington & Quincy, in acquisition of control of the Illinois Northern from the International Harvester Company. When the P.R.R. proposal was received, a Santa Fe-Burlington application for authority to acquire the I.N. was already before the commission in Finance Docket No. 16462 (see *Railway Age* of March 5, page 68). The commission's present action was an order, by Chairman Mahaffie, granting the P.R.R. and its parent leave to intervene in the proceeding and stipulating that their application for authority to participate in the acquisition was "filed" as a supplemental application in the case. Meanwhile, the Santa Fe and Burlington also filed a supplemental application, seeking approval of a revised acquisition plan which will provide for the P.R.R.'s participation. The revised plan contemplates that the Santa Fe will acquire 51 per cent of the I.N.'s stock while the Burlington will acquire 25 per cent and the P.R.R. 24 per cent. The original plan contemplated that the Santa Fe would acquire two-thirds of the stock and the Burlington one-third.

Union Pacific.—*Trackage Rights.*—Division 4 of the Interstate Commerce Commission has authorized this road and its lessor, the Los Angeles & Salt Lake, to amend a 1934 agreement under which they have trackage rights over Southern Pacific and Pacific Electric lines in the Long Beach, Cal., terminal area. Under a separate switching agreement, amendment of which was also approved by the commission, the P. E. performs all switching services involved, acting as agent of the U. P. The amended trackage agreement provides that the rights granted to the U. P. will cover approximately 25,800 ft. of track, as compared with approximately 8,700 ft. covered by the original agreement; but 13,460 ft. of the additional trackage is subject to a proviso stipulating that it shall be included only while the P. E. continues to perform the switching services. The revised agreements also modify the rentals for the trackage and the payments to the P. E. for performing the switching. In the latter connection, it is now provided that the payment shall be $8 per loaded car; former payments, covering both loads and empties, ranged from $2.25 per car for the first 2,000 cars switched in a year to $1.75 per car for all in excess of 4,000. The effective date of the new agreements is December 15, 1945, and both provide for retroactive payments on the new bases to that date.

New Securities

Division 4 of the Interstate Commerce Commission has **authorized:**

Akron Union Passenger Depot.—To issue $2,000,000 of first mortgage series A bonds, the proceeds of which will be applied toward the cost of constructing a new passenger station at Akron, O. The same report authorized the Pennsylvania and the Baltimore & Ohio to assume liability jointly, as guarantors, for the bonds. The bonds will be dated July 1 and will bear interest at the rate of 4½ per cent per annum, payable semiannually on January 1 and July 1, and will mature July 1, 1947. Redemption and sinking fund provisions, as previously reported in *Railway Age* of July 2, page 53, were also approved by the commission. The report approved a selling price of 98.10 with a 4½ per cent interest rate—the bid of Halsey, Stuart & Co., which will make the average annual interest cost approximately 4.63 per cent. The bonds were reoffered to the public at 100.

Chesapeake & Ohio.—To assume liability for $3,990,000 of equipment trust certificates to finance in part 51 Diesel-electric locomotives estimated to cost $5,032,156 (see *Railway Age* of July 9, page 148). The certificates will be dated August 1 and will mature in 30 semi-annual installments of $133,000 each, beginning February 1, 1950. The commission's report approved a selling price of 99.131 with a 2⅛ per cent interest rate—the bid of Halsey, Stuart & Co., which will make the average annual interest cost approximat ly 2.26 per cent The certificates were reoffered to the public at prices yielding from 1.1 to 2.55 per cent, according to maturity.

Wabash.—To assume liability for $2,925,000 of series B equipment trust certicates, the second installment of a proposed $9,690,000 issue, the whole of which would finance in part the acquisition of 27 Diesel-electric locomotives and 20 passenger-train cars (see *Railway Age* of March 5, page 69). The $2,925,000 of certificates involved in the present authorization will finance in part the purchase of 12 of the locomotives. These certificates will be dated March 1 and will mature in 15 annual installments of $195,000 each, beginning March 1, 1950. The commission's report approved a selling price of 98.15 with a 2 per cent interest rate—the bid of Harris, Hall & Co. and 4 associates, which will make the average annual interest cost approximately 2.30 per cent. The certificates were reoffered to the public at prices yielding from 1.25 to 2.55 per cent, according to maturity.

Average Prices Stocks & Bonds

	July 26	Last week	Last year
Average price of 20 representative railway stocks	37.69	37.02	49.34
Average price of 20 representative railway bonds	85.24	85.22	90.87

Dividends Declared

Atlanta & West Point.—50¢, payable August 1 to holders of record July 25.

Atlantic Coast Line.—$1.00, payable September 12 to holders of record August 15.

Great Northern.—Non-cumulative preferred, $1.00, payable September 21 to holders of record August 23.

Illinois Central.—6% preferred, $3.00, semiannual, payable September 1 to holders of record August 9.

Louisiana & Missouri.—7% guaranteed preferred, $3.50, semiannual, payable August 1 to holders of record July 22.

Louisville & Nashville.—88¢, quarterly, payable September 12 to holders of record August 1.

Western of Alabama.—reduced, $1.75, payable August 1 to holders of record July 25.

Investment House Publications

[The surveys listed herein are, for the most part, prepared by financial houses for the information of their customers. Knowing that many such surveys contain valuable information, *Railway Age* lists them as a service to its readers, but assumes no responsibility for facts or opinions which they may contain bearing upon the attractiveness of specific securities.]

Baker, Weeks & Harden, One Wall st., New York 5.

Central of Georgia. Highlights of address by Marion J. Wise before the New

York Society of Security Analysts, June 16.

Louisville & Nashville Railroad. Highlights of address by J. B. Hill before the New York Society of Security Analysts, June 17.

Western Pacific. Highlights of address by F. B. Whitman before the New York Society of Security Analysts, June 24.

Kerr & Co., 704 South Spring st., Los Angeles 14, Cal.

Union Pacific Railroad Company Oil and Natural Gas Properties. June 17, No. 830.

Smith, Barney & Co., 14 Wall st., New York 5.

Seaboard Air Line Railroad Company. Railroad Bulletin No. 31, July 20.

Atchison, Topeka & Santa Fe Railway Company. Railroad Bulletin No. 32, July 23.

Vilas & Hickey, 49 Wall st., New York 5.

Lehigh Valley General Consolidated Mortgage Bonds. July 1.

St. Louis-San Francisco Second Mortgage Income 4½s, 2022. July 8.

Railroad Income Mortgage Bonds. July 13.

RAILWAY OFFICERS

EXECUTIVE

K. M. Kerr, whose appointment as assistant to vice-president of the Atlantic Coast Line at Wilmington, N. C., was reported in the *Railway Age* of July 9, was born at New Albany, Ind., and was graduated from the University of Kentucky. Mr. Kerr entered railroad service on the Louisville & Nashville at Louisville, Ky., in 1934 and joined the Coast Line on January 1, 1938, as chief clerk to division freight agent at Jacksonville, Fla. During World War II he served as a lieutenant in the Transportation Corps, United States Army, returning to the A.C.L. in 1946 as assistant chief clerk to vice-president, and subsequently, chief clerk to vice-president.

J. M. Fields, vice-president—traffic of the Atlantic Coast Line, and traffic manager of the Columbia, Newberry & Laurens, with headquarters at Wilmington, N. C., has been elected also vice-president—traffic of the Charleston & Western Carolina.

Thomas J. Tobin, comptroller of the Erie, with headquarters at Cleveland, Ohio, has been elected also a vice-president of that company.

FINANCIAL, LEGAL & ACCOUNTING

The Bangor & Aroostook has announced that car accounting for the road has been transferred from the office of the superintendent of transportation to the accounting department, under the jurisdiction of **A. P. Warren,** general auditor. **G. R. White,** general accountant at Bangor, Me., has been appointed car accountant. **Earle H. Kelley,** of the disbursements audit office, has been appointed chief claims adjuster, to fill the vacancy created by the recent retirement of **Everett F. Curtis,** freight claim agent, who served the company for over 39 years.

Alfred A. Schmitt, special representative in the office of the vice-president, accounting department, of the Railway Express Agency, has been appointed general auditor of the New York regional accounting department, succeeding **Henry D. Freeman,** who has retired after more than 52 years of express service. Mr. Schmitt began express accounting work in his native Cincinnati, Ohio, more than 38 years ago. He was named district accountant at Kansas City, Mo., 10 years later and in October, 1922, was appointed chief clerk to general auditor at Philadelphia, Pa. Later he was special accountant attached to the general auditor's office at New York and on October 1, 1930, was appointed assistant to auditor of express receipts at New York. On January 1, 1933, Mr.

Alfred A. Schmitt

Schmitt became auditor of interline accounts at New York. Two years later he was named chief clerk to, and later assistant to, general auditor at New York. For several months prior to his present promotion, Mr. Schmitt had been serving as special representative attached to the vice-president's office, accounting department.

Mr. Freeman was born at Newark, N. J., and had been in charge of the Express Agency's New York regional accounting department since 1922. Except for a four-year assignment as general auditor at Philadelphia, Pa., when the various express companies were consolidated in July, 1918, all of Mr. Freeman's accounting service for the Agency was in New York.

OPERATING

Henry G. Arnold, whose retirement as superintendent, Middle division, Atchison, Topeka & Santa Fe, at Newton, Kan., was reported in the *Railway Age* of July 9 was born on April 5, 1882, at Livingston, Ala., and began his railroad career at the age of 15 as a water boy on the Southern. After service in the Spanish-American War he returned to the Southern as an operator and, from 1903 to 1914, held positions as telegraph operator and dispatcher on the St. Louis-San Francisco, Missouri Pacific and Union Pacific. He subsequently joined the Santa Fe as a dispatcher at Arkansas City, Kan., being advanced to chief dispatcher in 1918 and to trainmaster in 1919. In 1923 he was transferred to Newton, where he remained until his promotion to superintendent at Emporia, Kan., in 1937, except for one year when he was rules examiner at Topeka, Kan. Mr. Arnold also served as superintendent at Chillicothe, Ill., and in 1942 was appointed superintendent at Newton.

A. G. Thernstrom, superintendent of terminals of the Grand Trunk Western at Port Huron, Mich., has been appointed superintendent of the Chicago division, with headquarters at Battle Creek, Mich., succeeding **J. M. Munnings,** who has retired after 40 years of service. Mr. Thernstrom has been succeeded by **T. H. Ward,** assistant superintendent at Lindsay, Ont.

Mr. Thernstrom entered railroad service with the Grand Trunk in 1910, as a combination trucker, clerk, messenger

A. G. Thernstrom

and biller at Port Huron. He became an accountant in the transportation department at that point in 1916, and the following year was advanced to chief clerk. After serving in the armed forces during World War I, he returned to the Grand Trunk in his last-held position. Mr. Thernstrom was promoted to agent in 1933 and became superintendent of terminals in April, 1948.

Mr. Munnings was born on July 27, 1884, at Warren, Pa., and was graduated from high school in his home town. He began his railroad career in 1903 in the

Pennsylvania's warehouse at Warren, and later served as yardman and brakeman on the New York, Chicago & St. Louis and the Buffalo, Rochester & Pittsburgh (now part of the Baltimore & Ohio). From 1909 to 1916, he held the positions of yard foreman and general yardmaster on the Canadian National at Belleville, Ont., and London, and subsequently enlisted in the Canadian army. He joined the Grand Trunk in 1917 as yardman at Detroit, Mich., and later served successively as general yardmaster at Durant, Mich., and Pontiac until his promotion to trainmaster at Durant in 1933. Three years later he returned to Pontiac as trainmaster, becoming operating inspector at Detroit in May, 1940. Mr. Munnings was advanced to superintendent at Battle Creek in June, 1942.

R. Johnson, superintendent of the International-Great Northern (part of the Missouri Pacific Lines), at Palestine, Tex., has been promoted to assistant general manager and superintendent of transportation, with the same headquarters, succeeding **F. H. Cook,** granted a leave of absence because of ill health. Mr. Johnson has been replaced by **E. C. Sheffield,** acting superintendent at Kingsville, Tex. **G. M. Holzmann,** assistant superintendent of the Gulf Coast Lines (also part of M. P. Lines) at DeQuincy, La., has succeeded Mr. Sheffield, and has been replaced by **L. M. Elledge,** trainmaster of the I.-G. N. at San Antonio, Tex. **B. E. Glenn,** roadmaster of the I.-G. N. at San Antonio, has succeeded Mr. Elledge.

John N. Landreth, whose appointment as assistant to operating vice-president of the Atchison, Topeka & Santa Fe, at Chicago, was reported in the *Railway Age* of July 23, was born in 1902, at Shady Point, Okla., and began his railroad career at the age of 18, as an op-

John N. Landreth

perator-agent for the Union Pacific at Denver, Colo. He joined the Santa Fe in 1924 as a telegrapher at Slaton, Tex., and was subsequently employed in various positions on the Slaton division until 1942, when he became trainmaster, serving first at Wellington, Kan., and later at Las Vegas, N. M. Mr. Landreth was promoted to superintendent at Emporia, Kan., in 1946, and was subsequently transferred to Amarillo, Tex., and Winslow, Ariz. In January, 1949, he was advanced to assistant general manager of the Gulf, Colorado & Santa Fe at Galveston, Tex., which post he held until his recent appointment.

William M. Dempsie, assistant superintendent, motor vehicle equipment, of the Railway Express Agency, has been appointed assistant to the general superintendent of motive vehicle equipment, with headquarters at New York.

TRAFFIC

Aubrey Prentiss Hardy, whose promotion to assistant passenger traffic manager of the Southern Pacific Lines in Texas and Louisiana, with headquarters at Houston, Tex., was reported in the *Railway Age* of July 2, was born on May 9, 1901, at Wesson, Miss., where he attended high school. He began his railroad career in May, 1917, as a clerk at the Illinois Central's Gwin (Miss.) freight terminal, and subsequently held various clerical positions on the I. C. at McComb, Miss., and New Orleans, La., until his appointment as assistant city ticket agent of the S. P. at New Orleans in 1923. He was advanced to city ticket agent at that point in 1928 and, after serving as city passenger agent there from 1933 to 1944, became district passenger agent at San Antonio, Tex. Mr. Hardy was appointed district passenger agent at San Francisco, Cal., in March, 1945, which post he held until his recent promotion.

Harold F. Balte has been appointed assistant general freight agent of the Southern at Cincinnati, Ohio. **Junius W. Calvert,** district passenger agent at Norfolk, Va., has retired from active duty after 45 years of service with the Southern system.

E. B. Stanley, Jr., will become general agent of the Chicago, Indianapolis & Louisville at New Orleans, La., on August 1, succeeding the late **Gabe A. Fisher. Wynn W. Stumph,** general agent at Tulsa, Okla., will retire on August 6 after 34 years of service.

Joseph E. Griller, city passenger agent of the Chicago, Milwaukee, St. Paul & Pacific at Sioux City, Iowa, has been promoted to district passenger agent at Minneapolis, Minn.

J. R. Grimes, assistant to vice-president of the Chicago, Burlington & Quincy, with headquarters at Chicago, will become assistant fuel traffic manager, with the same headquarters, on August 1. He will be succeeded by **J. D. Rezner, Jr.,** general agent at Tulsa, Okla. Mr. Rezner will in turn be replaced by **M. G. Coffey,** fuel department general agent at Chicago. **Charles H. Bruha,** tariff bureau chief, at Chicago, will become assistant general freight agent in charge of fuel department rate work at that point.

A. L. Bardgett and **M. N. Lallinger,** assistant general freight agents of the St. Louis-San Francisco, at St. Louis, Mo., have been promoted to general freight agents, with the same headquarters.

MECHANICAL

W. F. Kascal, superintendent of motive power of the Colorado & Southern (part of the Burlington Lines) at Denver, Colo., will become mechanical superintendent of the Texas & Pacific at Dallas, Tex., effective August 1, succeeding **L. E. Dix,** whose retirement was reported in the *Railway Age* of July 2. Mr. Kascal entered railroad service in 1916 as a machinist's apprentice on the Chicago & North Western. Four years later he joined the Burlington at Brookfield, Mo.,

W. F. Kascal

serving as roundhouse foreman and general foreman with that road at Red Cloud, Neb., Hastings, Alliance, Omaha, Lincoln and Casper, Wyo., from 1927 to 1943. While located at Omaha and Lincoln he supervised maintenance of motive power of the "Pioneer Zephyr," the first Diesel-powered passenger train in regular service on a railroad in the United States. Mr. Kascal was subsequently advanced to master mechanic of the C. & S. at Denver, and was appointed superintendent of motive power there in June, 1947.

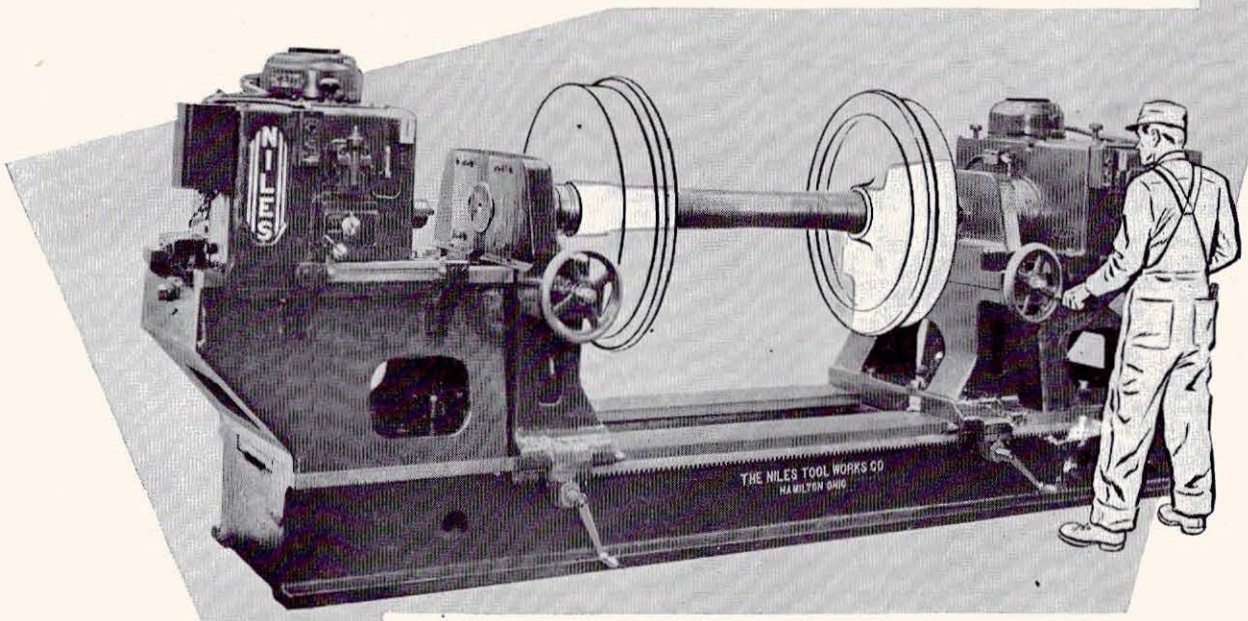
George F. Bachman, master mechanic of the Delaware, Lackawanna & Western at Buffalo, N. Y., has been promoted to superintendent of Diesel locomotive maintenance at Scranton, Pa., succeeding **I. R. Pease,** resigned.

PURCHASES and STORES

M. E. Baile, general storekeeper of the Missouri Pacific Lines at St. Louis, Mo., has been appointed assistant general

News Department continued on next left-hand page

Axles centered in 3 minutes



with ± .005" concentricity

This is the new Niles Hydraulic Centering Machine installed at the Glenwood wheel shops of the B&O.

The Baltimore & Ohio reports that an axle alone, or an axle with wheels mounted on it, can be centered on both ends in three minutes. At this rate, direct savings in labor amount to about 10% per year on the investment.

However, the really big saving results from the accuracy, both in alignment and in concentricity, of the centers. Centers are held to within ± .005 inches of concentricity with collars, journals or wheel seats. With such near-perfect centers, both an axle and the wheels mounted on it can be turned faster, with less material removed—with longer life and with far better balance of the mounted wheel set. Further, these savings in turning will be realized again and again as axles now going through the shop return for wheel attention later.

This Niles Hydraulic Centering Machine is designed to cut costs and improve quality of output of major wheel shops. It is a fitting companion to the Niles profiling attachment for car-wheel lathes, since, without accurate centers in axles, highly accurate concentricities in wheel treads are impossible.

With this machine, axles are chucked on collars, journals or, if unmounted, on wheel seats. Operation from that point on is fully automatic—traverse of both heads, boring to uniform depth, and return traverse.

Machine can also be used to check concentricity of journals and wheel treads. It will accommodate axles with inside or outside journals up to 6½" dia. (up to 12" if special chucking jaws are ordered), and mounted wheel sets up to 57" dia. It is powered by two 3-hp motors, utilizes hydraulic feed, and is completely self-lubricated.

For further information, call the Lima-Hamilton sales offices in New York or Chicago, representatives in other cities, or write directly to Lima-Hamilton Corporation, Hamilton, Ohio.

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DIVISIONS: *Hamilton, Ohio*—Niles Tool Works Co.; Hooven Owens, Rentschler Co. *Lima, Ohio*—Lima Locomotive Works Division; Lima Shovel and Crane Division.

PRINCIPAL PRODUCTS: Niles heavy machine tools; Hamilton diesel and steam engines; Hamilton heavy metal stamping presses; Hamilton-Kruse automatic can-making machinery; Locomotives; Cranes and shovels; Special heavy machinery; Heavy iron castings; Weldments.

purchasing agent at that point, succeeding the late **W. R. H. Mau,** whose death was reported in the *Railway Age* of July 2. Mr. Baile has been succeeded by **J. R. Fullerton,** traveling storekeeper, with headquarters at St. Louis.

ENGINEERING & SIGNALING

F. J. Corporon, assistant superintendent way and structures, Chicago South Shore & South Bend, has been advanced to superintendent way and structures, at Michigan City, Ind., succeeding the late **W. J. Mallon,** whose death was reported in the *Railway Age* of June 25.

C. M. Bishop, supervisor of signals of the Illinois Central, with headquarters at Chicago, has been appointed signal engineer of the Chicago, Rock Island & Pacific at that point, succeeding the late **C. R. Swenson,** whose death was reported in the *Railway Age* of June 11.

Earl F. Snyder, division engineer of the Illinois Central at Jackson, Tenn., has been transferred to Champaign, Ill., succeeding the late **William Richard Gillam. Lee W. Howard,** supervisor of track at Corinth, Miss., succeeds Mr. Snyder.

Maurice F. Anderson, communications engineer of the Chesapeake & Ohio's Pere Marquette district, with headquarters at Detroit, Mich., has been promoted to the newly created post of engineer communications and signals, succeeding to the duties of **Harry C. Lorenzen,** signal engineer and superintendent of telegraph, whose retirement was reported in the *Railway Age* of July

Maurice F. Anderson

2. **Garlan N. Black,** assistant signal engineer at Detroit, has been advanced to assistant engineer communications and signals, succeeding Mr. Anderson. **Robert W. Margsh,** assistant engineer, has replaced Mr. Black, and has been succeeded in turn by **Carl D. MacMillan,** signal draftsman. **Henry S. J. Minkes** has succeeded Mr. MacMillan.

Mr. Anderson was born on November 20, 1901, at Pinckneyville, Ill., and, after completing his high school education, attended the mining and railroad engineering schools of the University of Illinois for three years. He entered railroad service with the Illinois Central at Chicago as a signal draftsman, in January, 1925, and joined the Pere Marquette (now C. & O.), in the same capacity, in March, 1927. In 1932 he was promoted to signal foreman, and in 1939 was appointed signal gang foreman, becoming signal supervisor in 1940. Mr. Anderson was appointed assistant signal engineer at Detroit in March, 1942, and was advanced to communications engineer at that point in March, 1945.

SPECIAL

Raymond C. Burris has been appointed chief special agent of the Denver & Rio Grande Western at Denver, Colo. Mr. Burris formerly served successively as watchman, patrolman, special officer, and system special agent throughout the entire Rio Grande territory.

OBITUARY

O. Kenneth Quivey, 63, manager of agricultural development of the Baltimore & Ohio, died at Baltimore, Md., on July 21, after an operation.

Arthur L. Jackson, assistant passenger traffic manager of the Gulf, Mobile & Ohio, with headquarters at St. Louis, Mo., died in that city on July 19. Mr. Jackson was born on August 14, 1896, at St. Louis, and attended the public schools in his native city and the University of Texas, Austin, Tex. He began his railroad career as an office boy in the passenger department of the Chicago & Alton (now part of the G. M. & O.) at St. Louis. He subsequently served successively as clerk, assistant city ticket agent and city ticket agent until 1917, when he entered military service. Reurning to the railroad in 1920, Mr. Jackson became district passenger agent at Little Rock, Ark., and in 1933 was appointed traveling passenger agent for the Baltimore & Ohio and the Alton at Little Rock. In 1936 he was transferred to St. Louis in the same capacity, being advanced to general passenger agent of the Alton at Chicago, in 1943. Following acquisition of the latter road by the G. M. & O. in June, 1947, he was again transferred to St. Louis as general passenger agent. Mr. Jackson became assistant passenger traffic manager at St. Louis in October, 1947.

Charles P. Cahill, assistant to the vice-president— operations, of the Chicago, Rock Island & Pacific, with headquarters at Kansas City, Mo., died on July 20. Mr. Cahill, who was born on April 23, 1886, at Lydonville, Vt., entered railroad service in 1899 as a call boy on the St. Joseph & Grand Island (now Union Pacific.) During his early career he worked for several roads, holding positions as yard clerk, telegrapher, weighmaster, bill clerk, train dispatcher, chief dispatcher and train rules examiner. In 1917 he was made trainmaster of the U.P. at Kansas City, and in 1926 was advanced to assistant superintendent at Denver, Colo. He became superintendent of the Colorado and Kansas division of the U. P. in 1935, and later held positions as general superintendent and general manager at Omaha, Neb. Mr. Cahill joined the Rock Island in 1943 as assistant to general manager at Kansas City, and was promoted to assistant general manager at El Reno, Okla., in November, 1946. In February, 1948, after the reorganization of the Rock Island, he became assistant to the vice-president—operations.

Charles A. Wickersham, former president and general manager of the Atlanta & West Point and the Western of Alabama, whose death on July 12 was reported in the *Railway Age* of July 23, was born at Unionville, Pa., and began his railroad career at the age of 16 as a telegraph operator with the Pennsylvania at Coatesville, Pa. Mr. Wickersham later spent 12 years as dispatcher for the Chicago, Burlington & Quincy at Lincoln, Neb., and in 1892 became trainmaster for the Southern at Columbus, Miss. He was appointed superintendent of the Alabama Great Southern at Birmingham, Ala., in 1896 and served as president and general manager of both the Atlanta & West Point and the Western of Alabama from November, 1900, until his retirement on April 15, 1947. He was also general manager of the Georgia from 1913 to 1947.

Gabe A. Fischer, general agent of the Chicago, Indianapolis & Louisville at New Orleans, La., died recently.

Willam Richard Gillam, division engineer of the Illinois Central at Champaign, Ill., died recently in the I. C. hospital at Chicago, after an illness of three months. Mr. Gillam was in his 50th year of service with the railroad.

Martin Eckert, who retired in 1946 as chief accounting and financial officer of the Missouri Pacific Lines, with headquarters at St. Louis, Mo., died recently at his home in that city, at the age of 76.

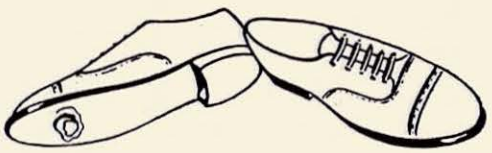
William M. Burrell, who retired on May 1, 1929, as New England agent of the Rutland at Boston, Mass., died on July 10 at St. Peterburg, Fla.

Lloyd E. Omer, former general passenger agent of the Union Pacific at Los Angeles, Cal., who retired in 1947, died on June 26 at his home in Huntington Park, Cal.

Revenue and Expense table appears on next left-hand page

SHOES—

and Superheater Units...



You would not repair one of a pair of shoes and not the other . . . neither is it wise to have part of a set of old superheater units remanufactured at our plant.

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OPERATING REVENUES AND OPERATING EXPENSES OF CLASS I STEAM RAILWAYS

Compiled from 128 monthly reports of revenues and expenses representing 132 Class I steam railways.

(Switching and Terminal Companies Not Included)

FOR THE MONTH OF MAY 1949 AND 1948

Item	United States		Eastern District		Southern District		Western District	
	1949	1948	1949	1948	1949	1948	1949	1948
Miles of road operated at close of month	226,659	227,197	53,490	53,697	46,040	46,164	127,129	127,336
Revenues:								
Freight	$615,922,588	$666,984,176	$238,093,751	$264,844,312	$130,255,248	$146,735,910	$247,573,589	$255,403,954
Passenger	67,858,393	71,786,399	35,870,366	36,640,706	10,249,566	10,781,432	21,738,461	24,364,261
Mail	19,198,897	15,936,809	6,866,877	5,660,070	3,439,178	2,963,501	8,892,842	7,313,238
Express	6,010,516	7,543,110	1,419,119	2,820,150	1,020,382	1,361,097	3,571,015	3,361,863
All other operating revenues	32,078,157	34,152,317	14,648,498	15,620,195	5,400,113	5,558,188	12,029,546	12,973,934
Railway operating revenues	741,068,551	796,402,811	296,898,611	325,585,433	150,364,487	167,400,128	293,805,453	303,417,250
Expenses:								
Maintenance of way and structures	121,013,198	113,424,595	43,973,528	41,939,976	22,951,842	23,022,609	54,087,828	48,462,010
Depreciation	10,581,658	10,382,881	4,444,210	4,410,331	1,852,608	1,815,368	4,284,840	4,157,182
Retirements	679,007	725,541	235,506	136,932	171,483	74,852	272,018	513,757
Deferred maintenance	*360,726	*392,973	*75,180	*291	*104,806	*75,884	*180,740	*316,798
Amortization of defense projects	151,462	135,314	15,922	15,128	46,252	47,408	89,288	72,778
Equalization	*7,854,874	*3,609,505	*4,027,797	*1,998,597	*1,225,919	*303,425	*2,601,158	*1,307,483
All other	117,816,671	106,183,337	43,380,867	39,376,473	22,212,224	21,464,290	52,223,580	45,342,574
Maintenance of equipment	142,570,964	140,041,069	59,462,422	60,812,348	29,369,690	28,020,264	53,738,852	51,208,457
Depreciation	23,237,189	20,707,528	9,051,427	8,251,311	5,198,392	4,558,390	8,987,370	7,897,827
Retirements	*69,424	*165,946	*15,161	*8,679	*22,632	*12,110	*31,631	*145,157
Deferred maintenance and major repairs	*94,883	*273,764	*53,620	.....	*6,727	*142,408	*34,536	*131,356
Amortization of defense projects	1,221,982	1,226,762	450,933	452,386	238,867	238,169	532,182	536,207
Equalization	279,206	331,421	*18,876	67,351	298,991	437,176	*909	*173,106
All other	117,996,894	118,215,068	50,047,719	52,049,979	23,662,799	22,941,047	44,286,376	43,224,042
Traffic	16,871,049	16,028,950	5,703,455	5,561,108	3,496,570	3,411,933	7,671,024	7,055,909
Transportation—Rail line	288,322,282	314,744,703	121,876,497	134,556,522	53,911,169	60,956,163	112,534,616	119,232,018
Miscellaneous operations	9,229,467	9,988,018	3,516,931	3,990,915	1,343,690	1,282,280	4,368,846	4,714,823
General	22,845,482	22,003,929	8,798,985	8,513,740	4,784,394	4,781,988	9,262,103	8,708,201
Railway operating expenses	600,852,442	616,231,264	243,331,818	255,374,609	115,857,355	121,475,237	241,663,269	239,381,418
Net revenue from railway operations	140,216,109	180,171,547	53,566,793	70,210,824	34,507,132	45,924,891	52,142,184	64,035,632
Railway tax accruals	69,181,314	75,966,674	25,606,924	32,205,057	17,626,954	21,897,171	25,945,436	21,864,446
Pay-roll taxes	21,677,197	21,712,154	9,011,749	11,952,748	4,147,424	4,469,949	8,518,024	5,289,457
Federal income taxes†	20,565,847	28,136,689	6,905,247	10,340,990	7,933,455	12,026,673	5,727,145	5,769,026
All other taxes	26,938,270	26,117,831	9,689,928	9,911,319	5,548,075	5,400,549	11,700,267	10,805,963
Railway operating income	71,034,795	104,204,873	27,959,869	38,005,767	16,878,178	24,027,720	26,196,748	42,171,316
Equipment rents—Dr. balance	10,066,093	10,668,306	5,041,405	4,491,975	*1,013,588	*870,573	6,038,276	7,046,904
Joint facility rent—Dr. balance	3,373,421	3,358,501	1,526,601	1,683,707	500,636	505,592	1,346,184	1,169,202
Net railway operating income	57,595,281	90,178,066	21,319,863	31,830,085	17,391,130	24,392,701	18,812,288	33,955,288
Ratio of expenses to revenue (percent)	81.1	77.4	82.0	78.4	77.1	72.6	82.3	78.9

FOR THE FIVE MONTHS ENDED WITH MAY 1949 AND 1948

Item	United States		Eastern District		Southern District		Western District	
	1949	1948	1949	1948	1949	1948	1949	1948
Miles of road operated at close of month	226,671	227,213	53,490	53,698	46,041	46,161	127,140	127,354
Revenues:								
Freight	$3,006,222,184	$3,113,960,967	$167,289,468	$1,200,697,248	$637,962,073	$660,269,891	$1,200,970,643	$1,252,993,828
Passenger	353,022,182	368,636,892	184,701,446	187,278,117	60,364,621	62,198,261	107,956,115	119,160,514
Mail	90,638,671	76,165,092	33,129,465	27,095,228	16,532,941	13,819,287	40,976,265	35,250,577
Express	28,453,112	48,458,655	7,581,058	15,634,433	5,761,508	9,232,389	15,110,536	23,591,833
All other operating revenues	155,485,482	161,391,701	69,816,564	71,837,156	26,834,770	27,734,803	58,834,148	61,819,742
Railway operating revenues	3,633,821,631	3,768,613,307	1,462,518,011	1,502,542,182	747,455,913	773,254,631	1,423,847,707	1,492,816,494
Expenses:								
Maintenance of way and structures	538,365,237	522,500,446	193,288,029	189,484,953	111,342,554	112,239,702	233,734,654	220,775,791
Depreciation	52,843,533	51,599,178	22,227,705	21,916,479	9,261,041	8,956,468	21,354,787	20,726,231
Retirements	4,065,817	4,043,258	1,241,765	901,561	642,998	432,891	2,181,054	2,708,806
Deferred maintenance	*1,237,167	*1,939,382	*328,422	*66,183	*290,635	*688,341	*618,110	*1,184,858
Amortization of defense projects	743,980	977,841	76,803	62,331	237,347	218,954	429,830	696,556
Equalization	2,404,012	6,165,998	1,334,774	3,187,948	2,165,964	1,809,331	*1,096,726	1,168,719
All other	479,545,062	461,653,553	168,735,404	163,482,817	99,325,839	101,510,399	211,483,819	196,660,337
Maintenance of equipment	700,702,682	690,750,436	288,435,026	294,733,694	141,486,613	138,623,148	270,781,043	257,393,594
Depreciation	112,658,668	101,027,310	43,457,196	39,764,499	25,298,035	22,430,428	43,903,437	38,832,383
Retirements	*330,964	*606,688	*65,648	*45,099	*62,928	*112,553	*202,388	*449,036
Deferred maintenance and major repairs	*676,631	*1,900,155	*347,750	.....	*187,811	*496,143	*141,070	*1,404,012
Amortization of defense projects	6,110,344	6,174,585	2,254,857	2,260,549	1,194,412	1,194,811	2,661,075	2,719,225
Equalization	1,182,080	2,049,423	6,194	417,830	1,088,437	1,662,905	87,449	*31,312
All other	581,759,185	584,005,961	243,130,177	252,335,915	114,156,468	113,643,700	224,472,540	217,726,346
Traffic	82,539,126	79,257,788	28,092,618	26,617,099	17,432,763	17,644,266	37,013,745	34,996,423
Transportation—Rail line	1,478,568,132	1,565,290,845	625,628,775	671,539,618	276,002,914	294,176,793	576,936,443	599,574,434
Miscellaneous operations	50,277,370	53,241,434	19,050,820	20,343,398	8,002,123	8,477,833	23,224,427	24,420,203
General	116,649,794	111,786,329	45,250,769	42,848,349	24,764,806	24,309,089	46,634,219	44,628,891
Railway operating expenses	2,967,102,341	3,022,827,278	1,199,746,037	1,245,567,111	579,031,773	595,470,831	1,188,324,531	1,181,789,336
Net revenue from railway operations	666,719,290	745,786,029	262,771,974	256,975,071	168,424,140	177,783,800	235,523,176	311,027,158
Railway tax accruals	349,410,878	388,546,053	132,096,384	143,145,587	85,061,208	92,631,123	132,253,286	152,769,343
Pay-roll taxes	107,262,106	142,851,955	44,215,150	62,382,712	20,818,434	28,282,711	42,228,522	52,186,532
Federal income taxes†	107,807,583	119,680,280	37,785,815	33,739,459	36,202,489	37,625,049	33,819,279	48,315,772
All other taxes	134,341,189	126,013,818	50,095,419	47,023,416	28,040,285	26,723,363	56,205,485	52,267,039
Railway operating income	317,308,412	357,239,976	130,675,590	113,829,484	83,362,932	85,152,677	103,269,890	158,257,815
Equipment rents—Dr. balance	50,297,362	54,269,149	23,932,739	26,279,689	*2,098,256	*3,687,327	28,462,879	31,676,787
Joint facility rent—Dr. balance	16,236,851	17,042,107	7,598,395	8,128,169	2,516,424	2,576,148	6,122,032	6,337,790
Net railway operating income	250,774,199	285,928,720	99,144,456	79,421,626	82,944,764	86,263,856	68,684,979	120,243,238
Ratio of expenses to revenues (percent)	81.7	80.2	82.0	82.9	77.5	77.0	83.5	79.2

† Includes income tax and surtax.
* Decrease, deficit, or other reverse item.
Compiled by the Bureau of Transport Economics, Interstate Commerce Commission. Subject to revision.

New Railroad Books

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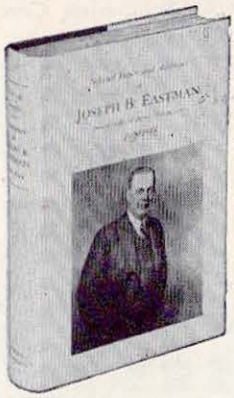

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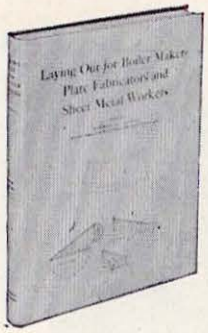

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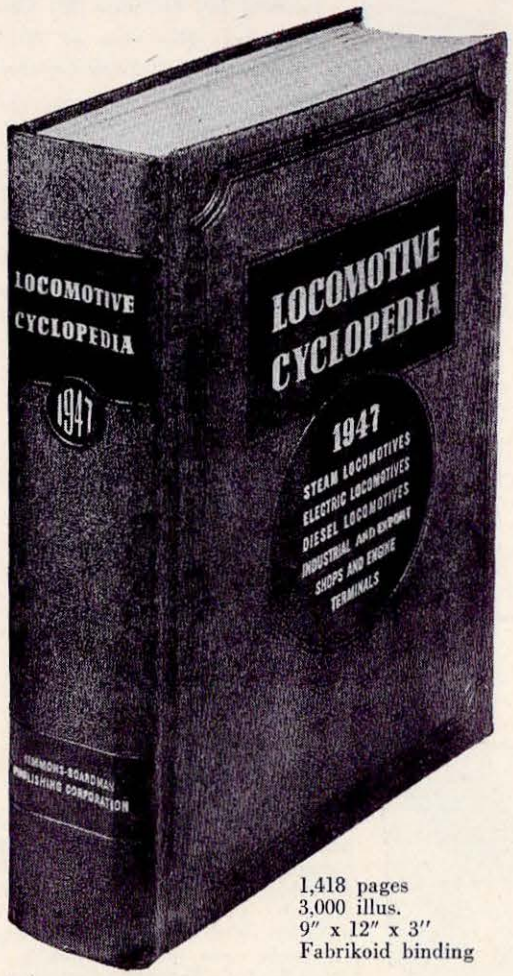

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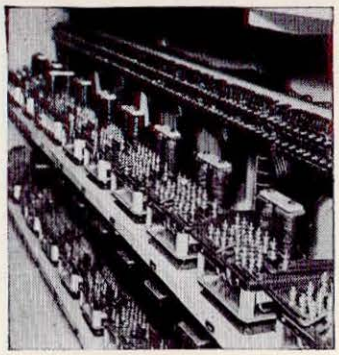

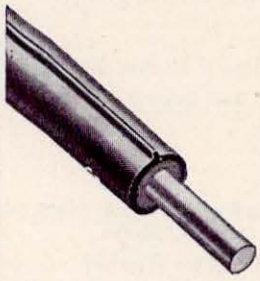

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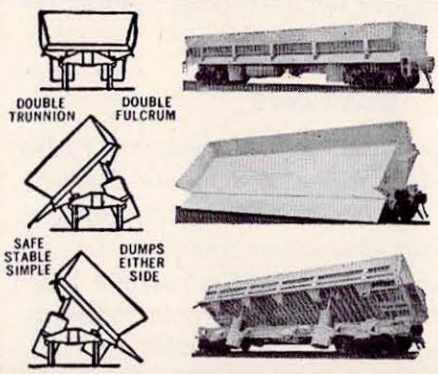

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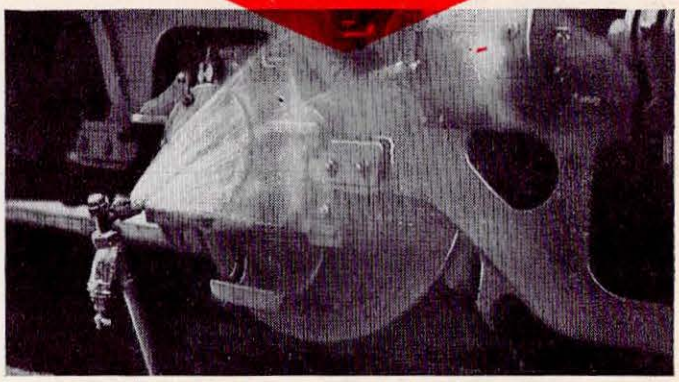

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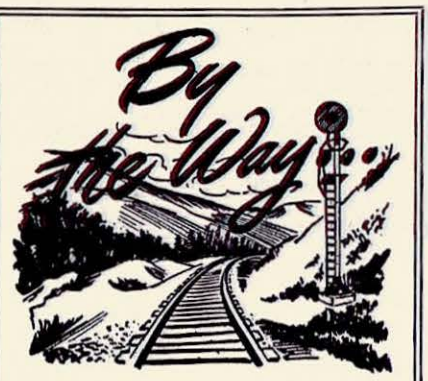

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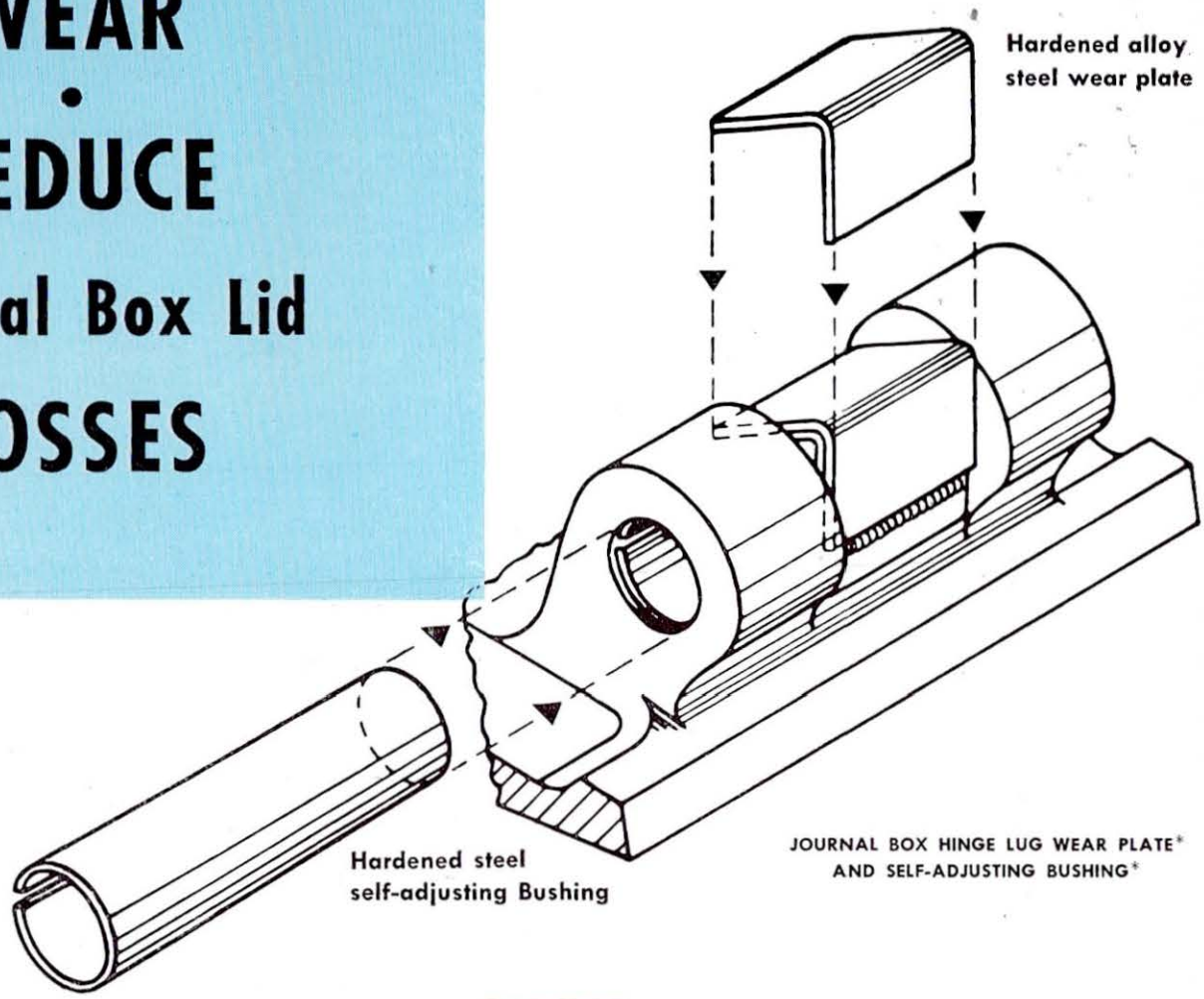

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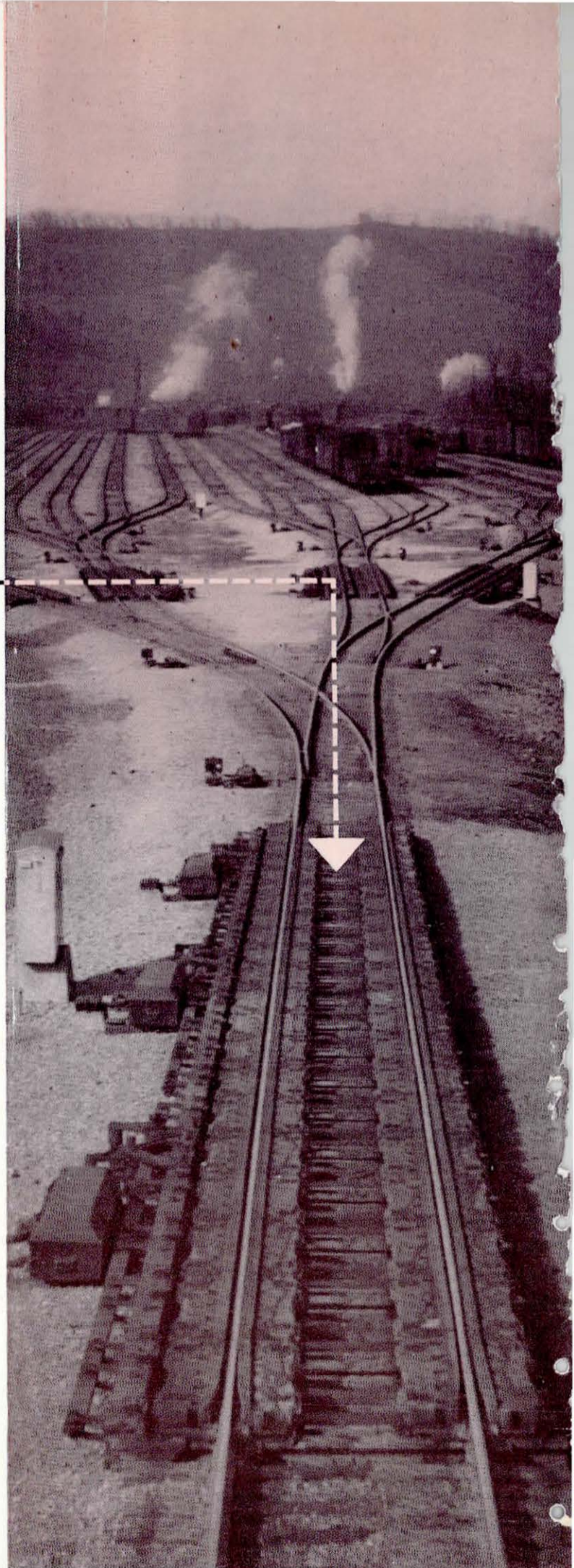

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